

Alamitos Barrier Project

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**Annual report on the control of seawater intrusion
2014 - 2015**

Member Agencies:

Orange County Water District
Water Replenishment District of Southern California
Long Beach Water Department
Golden State Water Company
Los Angeles County Flood Control District

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INTRODUCTION

The Alamitos Barrier Project (ABP) was designed and constructed to protect the groundwater supplies of the Central Basin in Los Angeles County and the southwest portion of the Coastal Plain area in Orange County from the intrusion of seawater through the Alamitos Gap area. The project facilities are located near the Los Angeles-Orange County border about two miles inland from the terminus of the San Gabriel River. The facilities include injection wells to form a freshwater pressure ridge and extraction wells to form a saltwater trough. The freshwater pressure ridge has proven to be historically effective, whereas the saltwater trough has not. As a result, the extraction wells are currently not in operation. A map showing the supply pipeline, injection wells, extraction wells, and observation wells is shown on page A-12.

The County of Los Angeles Department of Public Works (Public Works) operates and maintains the ABP and its associated facilities under the direction and approval of the Joint Management Committee (JMC), acting on behalf of the Los Angeles County Flood Control District (LACFCD) and the Orange County Water District (OCWD).

This report summarizes the following for the Fiscal Year (FY) 2014-15: Projects and Studies, Operations and Maintenance, Hydrological Effects, Chlorides, and Total Project Costs.

SUMMARY

During FY 2014-15, a total of 7,113.1 acre-feet (AF) of water was injected into the ABP. This corresponds to an average rate of 9.8 cubic feet per second. Of that total, OCWD purchased 2,236.2 AF (31 percent) and the Water Replenishment District of Southern California (WRD) purchased 4,876.9 AF (69 percent). This total injected amount was 420.8 AF (6.3 percent) more than FY 2013-14, and was approximately 1700 AF (30 percent) higher than the average injection of 5,442.5 AF for the previous five fiscal years. These higher injection rates were needed to counteract lower groundwater elevations, which are most likely the result of historic drought conditions. No major shutdowns have occurred since FY 2006-07. All minor shutdowns for FY 2014-15 are detailed in Appendix A-18.

The total costs associated with the ABP in FY 2014-15 are summarized below:

- Total Cost in FY 2014-15: \$9,149,572
 - Injection Water costs: \$7,335,803 (OCWD: \$2,301,686, WRD: \$5,034,117)
 - Total Operations and Maintenance costs: \$1,741,860
 - Injection-related costs: \$1,678,124 (OCWD: \$510,783, LACFCD: \$1,167,341
 - Equivalent cost per AF of water injected: \$235.92/AF
 - Extraction-related costs: \$13,714 (LACFCD only)
 - Special Programs: \$50,022 (LACFCD only)
 - Liability Insurance cost: \$71,910 (OCWD: \$35,955, LACFCD: \$35,955)

Overall, groundwater levels decreased slightly or showed little change from the previous year, with localized decreases related to operational activities. Generally, levels along the southeast portion of the barrier remained below protective elevations due to the limited injection capabilities (e.g. quantity of wells, pressure limitations, maintenance, etc).

Chloride concentrations generally decreased from the previous year west of the San Gabriel River with exceptions. East of the San Gabriel River, widespread elevated chloride concentrations were still present, with some wells exhibiting a decrease in chloride concentrations. Detailed analyses of the reporting period's groundwater elevations and chloride concentrations are provided in the "Hydrogeologic Effects" and "Chlorides" sections below.

It is imperative that the barrier operate consistently and continuously to best prevent seawater intrusion. The JMC will continue to press forward to ensure that the ABP is operated and maintained efficiently, economically, and continuously protects the groundwater supplies of the Central Basin of Los Angeles County and the Coastal Plain in Orange County. The installation of additional injection wells as part of OCWD's Unit 14 Project will significantly improve the effectiveness of the ABP.

PROJECTS AND STUDIES

Studies and capital improvement projects over this reporting period are briefly summarized below. The general location of each project is identified on the map in Appendix A-12 and further project details are included in Appendix A-17.

ABP Telemetry Upgrade

This project is funded by LACFCD. LACFCD utilized an as-needed contract with Tetra Tech to design a telemetry system, which includes replacement of the existing Geomation system with a state-of-the-art telemetry system that can be integrated with the existing PLC based system. The ABP Telemetry Upgrade will also incorporate

signals from injection well 33U3 which is not currently on telemetry. This project will help improve the overall efficiency of ABP operations by providing real-time data, indicating flow, pressure, water level and vault flooded status. The design phase of the project will be completed by November 2015, and construction is anticipated to start in Fall 2016.

ABP Unit 14 – Injection and Observation Wells

This project is jointly funded by OCWD and LACFCD and managed by OCWD. It consists of 17 new clustered injection wells, four nested observation wells and two shallow piezometers along the east leg of ABP. Two injection wells and one observation well are proposed to be installed between points B and C. These new injection wells will provide additional injection capacity to elevate groundwater levels along the east leg of the ABP. The observation wells will fill data gaps in each of the aquifer zones and assist in injection operations. During this reporting period, OCWD advertised the project and received no bids. Subsequently, OCWD made modifications to the noise wall footings and construction sequencing to make the project more attractive to prospective drilling contractors. Following completion of those modifications, OCWD will rebid the project. Construction is anticipated to begin in early 2016.

OPERATIONS AND MAINTENANCE

Injection Operations

The total amount of water injected into the ABP during FY 2014-15 was 7,113.1 AF. Of this total, approximately 468.3 AF (7 percent) was reclaimed water and 6,644.8 AF (93 percent) was imported water. The maximum monthly injection during this reporting period was 728.4 AF which occurred in September 2014. The minimum monthly injection of 392.8 AF occurred in April 2015 due to slightly higher groundwater levels related to decreased pumping associated with Metropolitan Water District's in-lieu program in Spring 2015.

The percentage of reclaimed injection decreased from the previous year due to the ongoing expansion of the Leo J. Vander Lans Advanced Water Treatment Facility

(AWTF). The AWTF was taken offline in March 2014 and came back online after the plant expansion was completed in September 2014. The AWTF ran intermittently from September 2014 to June 2015.

The California Regional Water Quality Control Board (CRWQCB) permit, File No. 93-076 of Order No. R4-2005-0061, was renewed during the FY14-15 reporting period to allow for startup of the AWTF until completion of the plant expansion project. According to this permit, the 60-month running average of reclaimed water into the ABP cannot exceed 50 percent of the total water volume injected. Through this reporting period, WRD's calculated 60-month running percentage of reclaimed water into the ABP was 27.2 percent and was therefore in compliance with the CRWQCB permit. The new CRWQCB permit, Order No. R4-2014-0111 effective October 1, 2015, does not contain a limitation on the 60-month running average of reclaimed water into the ABP.

The injection volumes and costs for FY 2013-14 and FY 2014-15 are shown in Table 1. The representative unit costs included in Table 1 for imported and reclaimed water were calculated by WRD. Table 1 shows that the volume of water injected at the ABP during FY 2014-15 increased by 6.3 percent from the previous year. The amount of water injected at the ABP in FY 2014-15 is considerably higher than historical volumes and is the second highest amount in the past 30 years. The volume injected is also about 30 percent higher than the average injection amount over the previous five fiscal years (5,442.5 AF). These higher injection rates were needed to counteract lower groundwater elevations, which are most likely the result of historic drought conditions.

All ABP shutdowns from FY 2014-15 are summarized in Appendix A-18. There were no major shutdowns during this reporting period.

Figure 1 presents the monthly amounts of water injected during FY 2013-14. Figure 2 illustrates the annual amounts of water injected over the last 20 years.

FIGURE 1 - MONTHLY AMOUNT OF WATER INJECTED

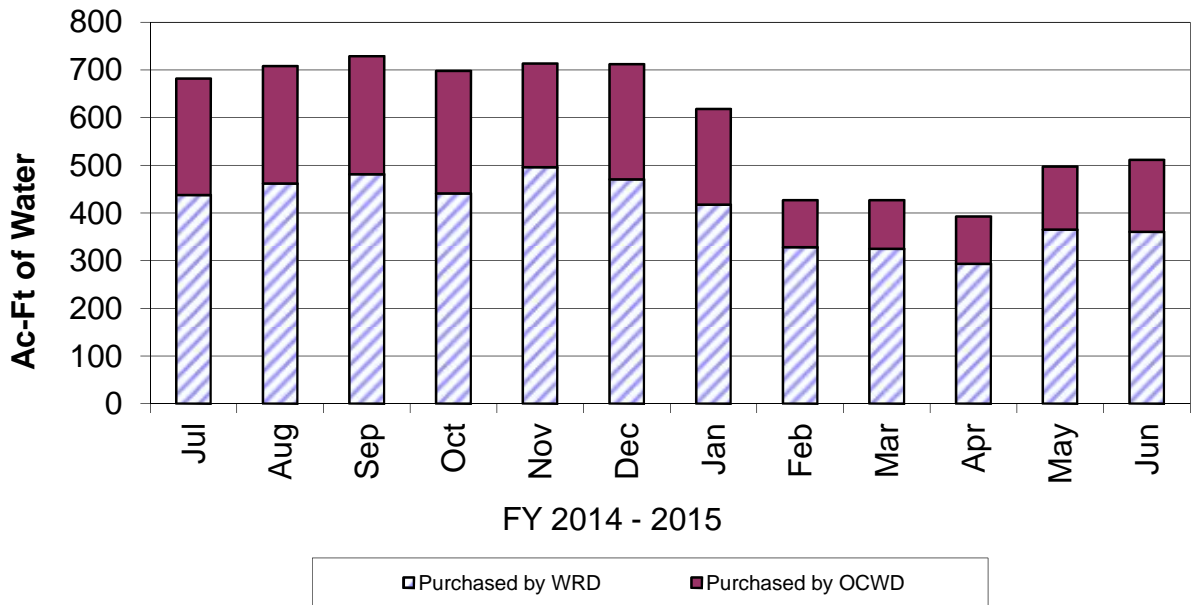


FIGURE 2 - ANNUAL AMOUNT OF WATER INJECTED

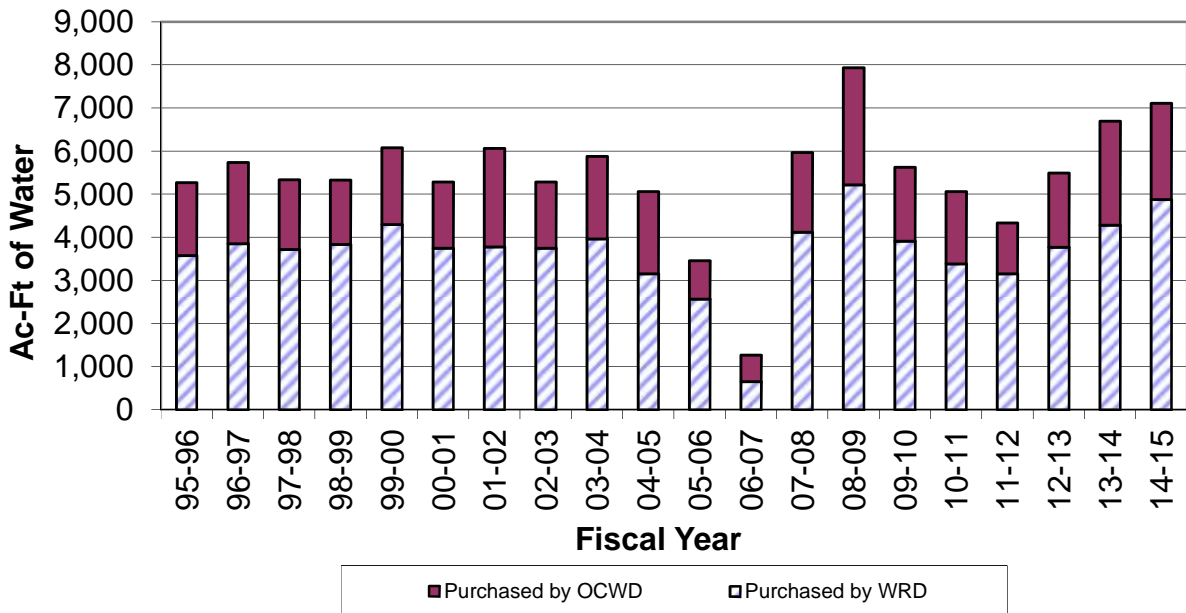


TABLE 1. INJECTION OPERATIONS

	Imported Water Injections			Reclaimed Water Injections			Total Injections		
	FY13-14	FY14-15	Percent Change From Previous Year	FY13-14	FY14-15	Percent Change From Previous Year	FY13-14	FY14-15	Percent Change From Previous Year
<u>VOLUME OF WATER INJECTED IN ACRE-FEET</u>									
OCWD ¹	2,078.0	2,090.4	0.6	328.3	145.8	-55.6	2,406.3	2,236.2	-7.1
WRD ²	3,698.5	4,554.4	23.1	587.5	322.5	-45.1	4,286.0	4,876.9	13.8
TOTAL	5,776.5	6,644.8	15.0	915.8	468.3	-48.9	6,692.3	7,113.1	6.3
<u>UNIT COST OF WATER PER ACRE-FEET³</u>									
JULY - DEC	\$970.24	\$1,015.96	4.7	\$970.24	\$1,015.96	4.7			
JAN - JUN	\$1,013.60	\$1,053.96	4.0	\$1,013.60	\$1,053.96	4.0			
<u>COST OF WATER PURCHASED</u>									
OCWD ¹	\$2,067,154	\$2,152,920	4.1	\$325,259	\$148,765	-54.3	\$2,392,414	\$2,301,686	-3.8
WRD ²	\$3,675,261	\$4,704,665	28.0	\$580,717	\$329,452	-43.3	\$4,255,978	\$5,034,117	18.3
TOTAL	\$5,742,415	\$6,857,585	19.4	\$905,977	\$478,217	-47.2	\$6,648,392	\$7,335,803	10.3
<u>AVERAGE INJECTION RATE IN CFS</u>									
OCWD ¹	2.9	2.9	0.6	0.5	0.2	-55.6	3.3	3.1	-7.1
WRD ²	5.1	6.3	23.1	0.8	0.4	-45.1	5.9	6.7	13.8
TOTAL	8.0	9.2	15.0	1.3	0.6	-48.9	9.2	9.8	6.3

¹ Orange County Water District (OWCD)

² Water Replenishment District (WRD)

³ The Unit Cost of **Imported Water** Per Acre-Foot is the sum of the Metropolitan Water District's wholesale rate at LB-07A (managed by Long Beach Water Department), the \$5 Administrative Surcharge, Readiness-To-Serve (RTS) costs, and Capacity costs (using total volume plus penalties). This amount is greater than what is shown on monthly invoices because Capacity costs are not typically known or accounted for at the time of those invoices. Based on the agreement between the OCWD and the WRD, the representative Unit Cost of **Reclaimed Water** Per Acre-Foot is equal to that of the imported water and is shown in the calculations by the WRD.

ADDITIONAL NOTES:

- The Unit Cost of Reclaimed Water for January through June 2015 was not yet available at the time of the Annual JMC Meeting. This value was estimated to be \$1,053.97 by adding the July through December 2014 RTS & CC charges to the January through June 2015 imported unit cost. Therefore, both the cost of reclaimed water and the overall total cost of injection water for FY14-15 are estimates only and should not be used for any other purposes.

EXTRACTION OPERATIONS

There were no extraction activities during FY 2014-15. As recommended by the JMC, these wells were taken out of operation in FY 2002-03. This decision was based on the results of a one-year extraction well efficiency study, which demonstrated that the chloride levels in the area decreased when the extraction wells were turned off. The extraction wells will continue to receive minimal maintenance so that they can be converted to monitoring wells in the future.

MAINTENANCE

Typical well maintenance at the ABP includes observation well cleanouts and injection well redevelopments. The purpose of observation well cleanouts is to remove accumulated sediment at the bottom of the well casings. Removing the sediment ensures the full lengths of the well screens are in communication with the aquifer, and also allows chloride sampling to occur at all designated depths. All 220 active observation wells are typically analyzed for sediment accumulation every two years. Following the analysis, every observation well determined to have significant sediment accumulation (i.e., covering a portion of the well screen) then receives the necessary cleanout services. Once cleanout activities are completed, each casing is bottom sounded to determine whether or not sediment removal activities were successful. When cleanouts are unsuccessful, such as when sediment refills the well due to a hole in the casing or the well is packed with foreign material, recommendations are developed for well replacement. The results of unsuccessful cleanouts are combined with the results of the ABP Condition Assessment to create a prioritized list of observation wells to be replaced. During FY 2014-15, 14 observation well casings were successfully cleaned out and 2 observation wells were unsuccessful. A new cleanout cycle is scheduled to start in 2016.

The purpose of redeveloping an injection well is to remove accumulated sediments and microbiological build-up within the well casings to restore each well's ability to operate at its maximum injection capacity. Each of the 41 injection well casings are routinely redeveloped once every two years. During FY 2014-15, Public Works completed

redevelopment activities at the following 8 well casings¹: 34E(C,B), 34E(I), 34F(I), 34G2(C,B), 34G2(I), 34H(I), 34Z(I), 35F(I).

Figure 3 depicts the operating status of each injection and extraction well during FY 2014-15 and demonstrates that the barrier was in operation throughout the entire reporting period. There were minimal ABP shutdowns, as explained below and summarized in Appendix A-18. Also, injection wells 34G, 33S1 and 33W operated at a limited flow due to surface leakage.

Injection well 34H(A) continues to remain offline. The well was removed from service due to high casing pressure while operating with minimal flow. A video log was conducted in February 2015, which found that the well was filled with sediment most likely from a hole at the top of the perforations. Since the well has a 6" diameter casing, using a sleeve to patch holes in the casing is not feasible. This injection well will remain disassembled. Injection well 34H(I), the other casing in this nested well, remains online.

Injection well 34G is operating with minimal flow due to surface leakage. A cone penetration test was conducted in December 2014 to determine the lateral extent of the clay layer and possibly identify the cause of the surface leakage. In May 2015, 34G was video logged to determine if a damaged well casing was the cause of the leakage. Close inspection revealed that the casing may have poor quality welds which could result in surface leakage. In late May 2015 a packer test was conducted to determine if these suspect welds actually leak. The test showed that the well was indeed leaking in the blank casing less than 100' from the surface. Injection well 34G is scheduled to have a packer installed just above the perforations to alleviate surface leakage.

Injection well 34S experienced a temporary shutdown in November due to a ruptured lateral line manifold. The drain plug located at the bottom of the manifold ruptured causing the vault to flood causing damage to the Los Alamitos Channel access road.

¹ The capital letters in parenthesis represent the aquifer(s) associated with that particular injection well casing. For example, (A) = A Zone aquifer, (A,I) = A and I Zone aquifers, and so forth.

Injection well 34V was shut down as a precaution since the well had the same manifold design and was installed at the same time as well 34S. New manifolds were fabricated and installed in March of 2015.

FIGURE 3 - ABP INJECTION AND EXTRACTION WELL STATUS - FY2014-15

Well No.	2014						2015					
	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
33G (A,I)												
33J (A,I)												
33L (A,I)												
33N (A,I)												
33Q (A,I)												
33Q1 (C,B)												
33S (A,I)												
33S1 (C,B)	S	S	S	S	S	S	S	S	S	S	S	S
33T (A,I)												
33U (A,I)												
33U3 (C,B)												
33V (A,I)												
33W (C,B,A,I)	S	S	S	S	S	S	S	S	S	S	S	S
33X (C,B,A,I)												
33Y (C,B,A,I)												
33Z (C,B,A,I)												
33Z2 (A)	O	O	O	O	O	O	O	O	O	O	O	O
33Z2 (I)												
34D (C,B,A,I)												
34E (C,B)												
34E (I)												
34F (A)												
34F (I)												
34G (A)	S	S	S	S	S	S	S	S	S	S	S	S
34G2 (C,B)												
34G2 (I)												
34H (A)	O	O	O	O	O	O	O	O	O	O	O	O
34H (I)	O	O	O	O	O	O	O	O	O	O	O	O
34J (A)												
34J (I)												
34L (C,B,A,I)												
34S (A)												
34S (I)												
34S (C,B)												
34V (A)												
34V (I)												
34V (C,B)												
34Z (I)												
35F (I)												
35G (A,I)												
35H1 (A)												
35H1 (I)												
35H2 (A)												
33V'15P	N	N	N	N	N	N	N	N	N	N	N	N
34H'17P	N	N	N	N	N	N	N	N	N	N	N	N
34H'18P	N	N	N	N	N	N	N	N	N	N	N	N
34S'22P	N	N	N	N	N	N	N	N	N	N	N	N

*Extraction Well

<input type="checkbox"/> - Well in Operation	<input type="checkbox"/> H - Header Repair	<input type="checkbox"/> P - Pressure Exceedance	<input type="checkbox"/> U - Under Construction
<input type="checkbox"/> C - Casing Repair	<input type="checkbox"/> M - Misc. Repair	<input type="checkbox"/> R - Redevelopment	<input type="checkbox"/> W - Water Quality Sampling
<input type="checkbox"/> D - Disassembled	<input type="checkbox"/> N - Not Needed	<input type="checkbox"/> S - Surface Leakage (operating with reduced flowrate)	<input type="checkbox"/> X - Waiting for Repair
<input type="checkbox"/> G - Grouted	<input type="checkbox"/> O - Other Circumstances	<input type="checkbox"/> T - Tremie Repair	<input type="checkbox"/> B - Barrier Shutdown

HYDROGEOLOGIC EFFECTS

Figures 4 through 8 (pp. 14-18) show the average monthly groundwater elevation relative to the average groundwater elevation of the 10 preceding years (FY 2004-05 to 2013-14) in the vicinity of the barrier alignment in the R, C, B, A, and I Zones, respectively. Two graphs were created for each aquifer to account for changes in groundwater elevation trends along two portions of the barrier alignment: wells west of the San Gabriel River and wells east of the San Gabriel River. It is important to note that the 10-year average does not represent a groundwater elevation goal nor does it specifically reflect barrier performance, but is simply included for comparison purposes. For example, the 10-year historical average included in the graphs for the FY 2014-15 report is generally higher than the one shown in the FY 2013-14 report because the FY 2012-13 data now included was generally higher than the FY 2003-04 data that it replaced. The graph includes all available semi-monthly, monthly, semi-annual, and annual data for wells within the barrier alignment and landward for approximately 2,000 feet from the barrier. As a result, semi-monthly values are “weighted” more heavily than the annuals in the calculation of the monthly average.

As shown in the graphs, groundwater elevations during FY 2014-15 were typically at or above historical averages. This was likely due to increased injection rates compared to those in FY 2013-14. East of the San Gabriel River, groundwater elevations were above 10-year historical averages for most of the reporting period with the exception of February and March. The lower groundwater elevations in February and March could be attributed to drought conditions resulting in more pumping than usual in February and March. West of the San Gabriel River, groundwater elevations were at or above the 10-year historical averages for most of the reporting period. September and March consistently have lower values than preceding and succeeding months due to the fact that semi-annual chloride sampling and sampling are measured during these months. In addition, November groundwater levels appear lower than other months because water level data obtained from the annual and semi-annual groundwater measurement and annual chloride sampling events are also included in the averages. In general, all

the figures show the expected seasonal trends of higher groundwater elevations in the winter months (decreased pumping) and lower groundwater elevations in the summer months (increased pumping).

FIGURE 4a RECENT ZONE WEST OF THE SAN GABRIEL RIVER

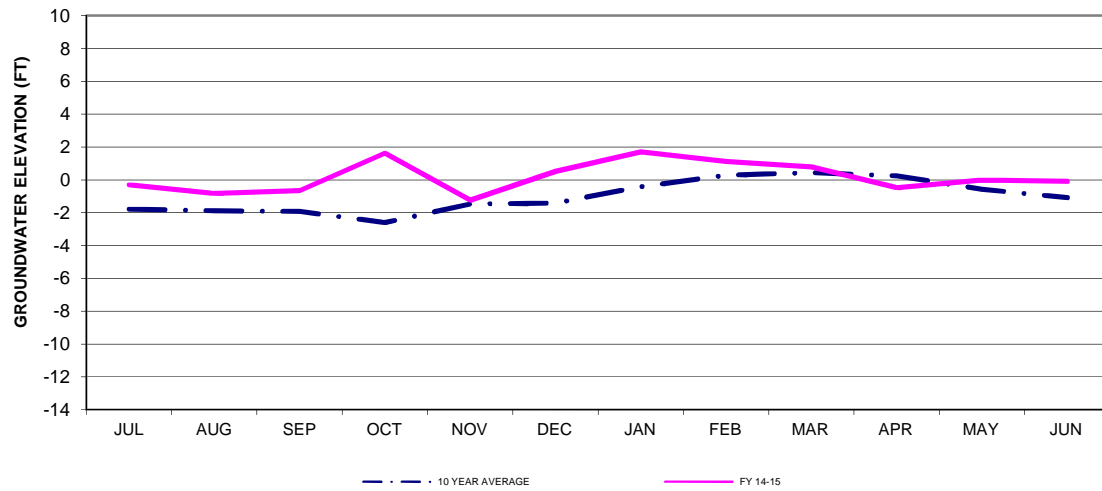


FIGURE 4b RECENT ZONE EAST OF THE SAN GABRIEL RIVER

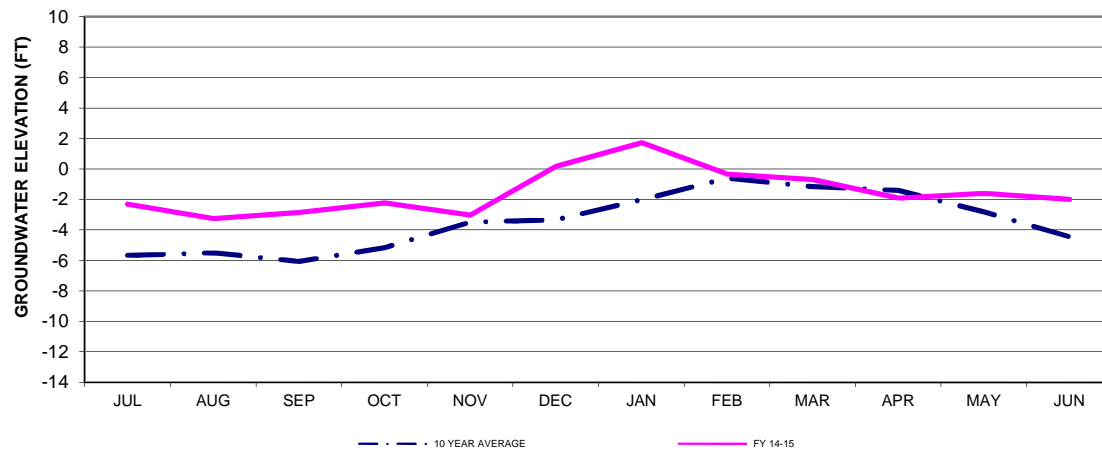


FIGURE 5a C-ZONE WEST OF THE SAN GABRIEL RIVER

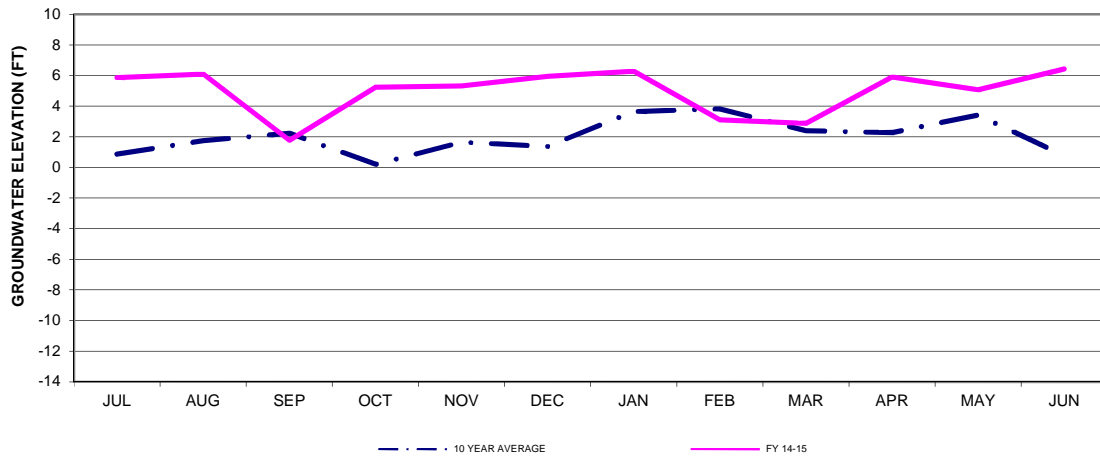


FIGURE 5b C-ZONE EAST OF THE SAN GABRIEL RIVER

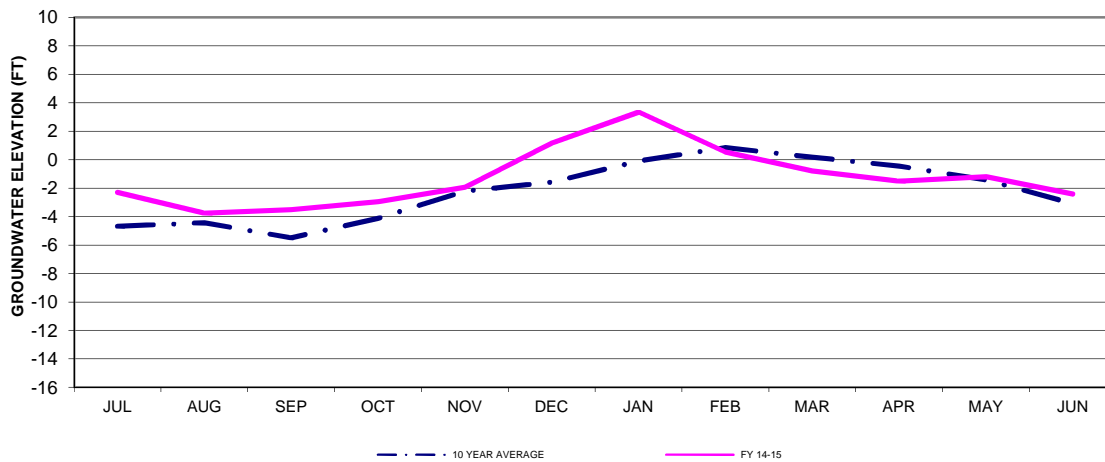


FIGURE 6a B-ZONE WEST OF THE SAN GABRIEL RIVER

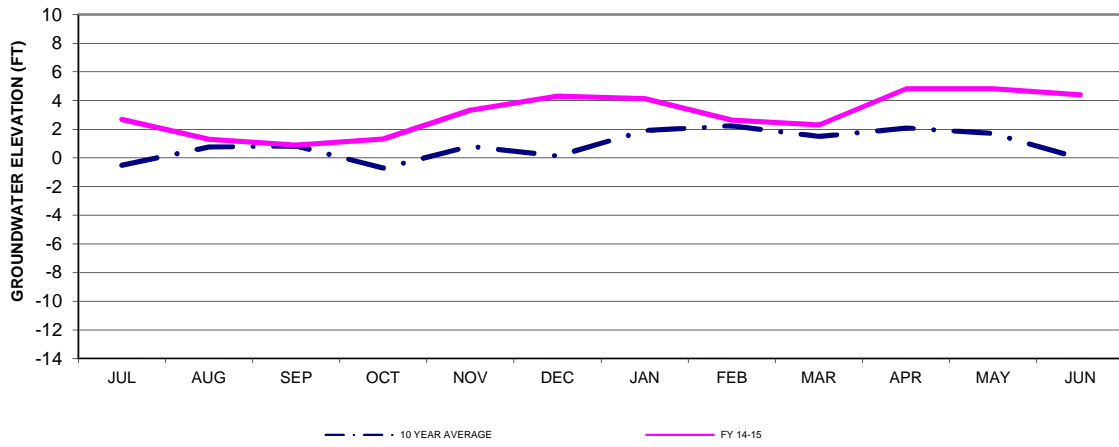


FIGURE 6b B-ZONE EAST OF THE SAN GABRIEL RIVER

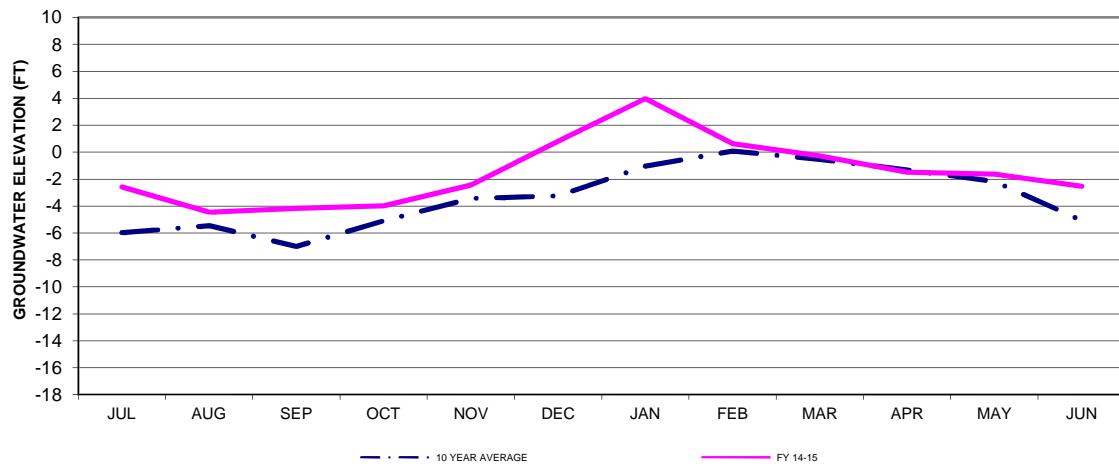


FIGURE 7a A-ZONE WEST OF THE SAN GABRIEL RIVER

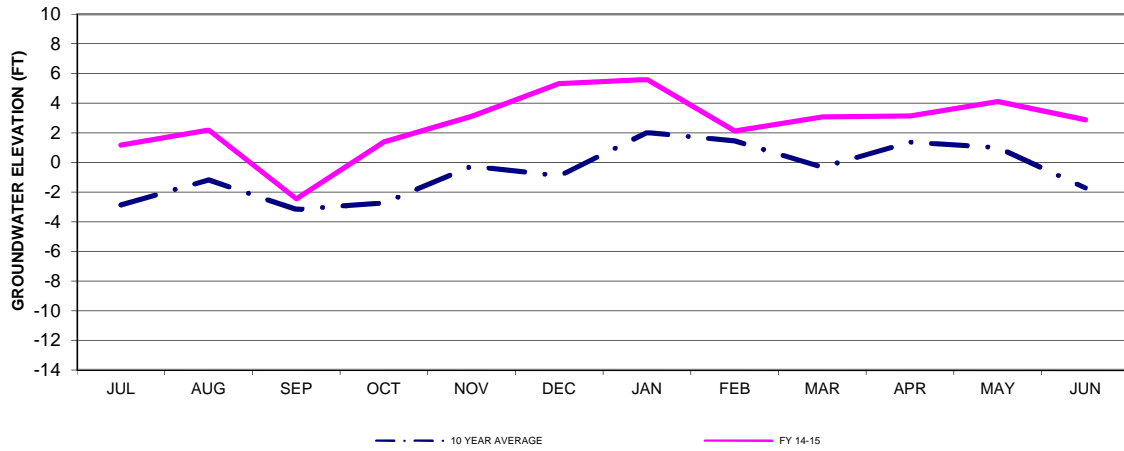


FIGURE 7b A-ZONE EAST OF THE SAN GABRIEL RIVER

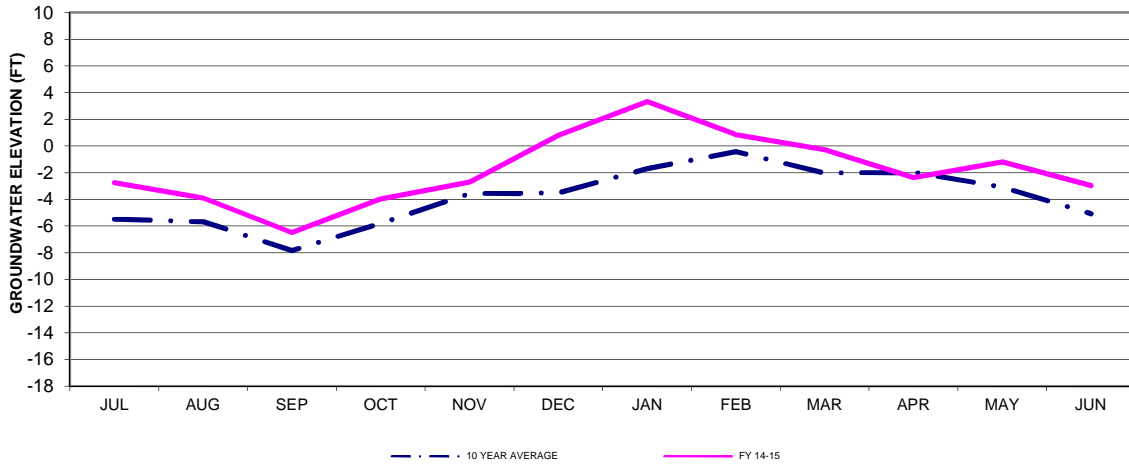


FIGURE 8a I-ZONE WEST OF THE SAN GABRIEL RIVER

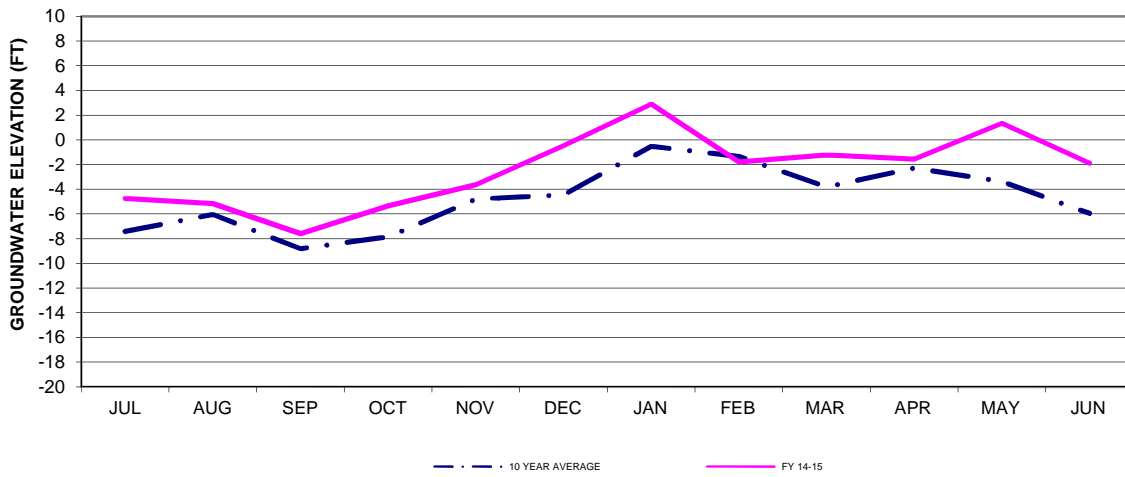
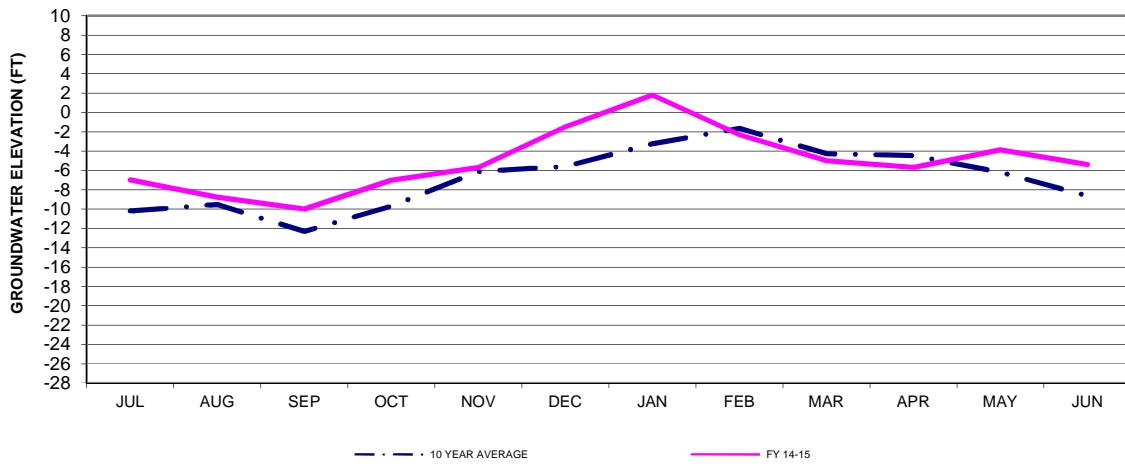


FIGURE 8b I-ZONE EAST OF THE SAN GABRIEL RIVER



Groundwater elevation contours for the R, C, B, A, and I Zones have been prepared from data collected in Spring 2015 and are included in Appendix A-1.1, 2.1, 3.1, 4.1, and 5.1. In general, the contours show that the groundwater levels were the highest near the barrier alignment, and typically decrease moving landward. The general shapes of each contour are similar to the previous year and some similar groundwater mounds are seen around certain injection wells. Also, it should be noted that areas historically having higher groundwater elevations in the C and B zones, especially near the bend at the San Gabriel River, continued to have higher groundwater elevations than their surroundings. Other areas of historically elevated groundwater levels (e.g., near 33XY and 33YZ) remained relatively constant when compared to the same time last year. This is likely due to the barrier remaining in full operation during the entire reporting period.

Contours of **changes** in groundwater elevations for the R, C, B, A, and I Zones between Spring 2014 and Spring 2015 are shown in A-1.2, 2.2, 3.2, 4.2, and 5.2. Available groundwater elevations data from Spring 2014, was subtracted from the corresponding and available data from Spring 2015 (shown in A-1.3, 2.3, 3.3, 4.3, and 5.3). These contours clearly identify increases and decreases in groundwater elevations from one reporting period to the next. In general, most areas saw very little changes in groundwater elevation. Below is a brief summary and discussion of each aquifer zone:

- R Zone:
 - Groundwater elevations remained fairly consistent in the vicinity of the ABP, with increases of about 1 foot along the west leg of the barrier.
 - Groundwater elevations decreased about 1 foot along the barrier alignment between the San Gabriel River and the Los Alamitos Channel, and decreased about 2 feet along the east leg of the barrier.
- C Zone:
 - Groundwater elevations increased between 1 and 2 feet between Los Cerritos Channel and San Gabriel River.
 - Groundwater elevations decreased approximately 2 feet along the east leg

of the barrier adjacent to Los Alamitos Channel, and remained constant near the furthest extent of the barrier's east leg.

- B Zone:
 - Groundwater elevations remained constant or decreased along the west leg, and decreased over 4 feet in the vicinity of the San Gabriel River (e.g. 33XY and 34DG).
 - Groundwater elevations decreased slightly at the eastern end of the barrier (e.g. 34JL, 34LS and 34T0.1)
- A Zone:
 - Groundwater elevations increased slightly along the west leg of the Barrier.
 - Groundwater elevations remained constant or increased slightly along the barrier alignment just east of the San Gabriel River.
 - Groundwater elevations decreased along the east leg, with localized decreases up to 4 feet (e.g. 34LS). These decreases are likely the result of emergency repairs to injection wells 34S and 34V.
- I Zone:
 - Groundwater elevations generally increased along the west leg.
 - Groundwater elevations remained constant along the northern portion of the east leg, and decreased up to 8 feet along the Los Alamitos Channel (e.g. 34VZ). This is likely due to the fact that injection wells 34J, 34S, and 34V were shut down intermittently to facilitate the repair on 34S and retrofit of 34V during Spring 2015.

Graphs showing the average, maximum and minimum groundwater elevations at each internodal observation well throughout FY 2014-15 are included in Appendix A-13 through A-16. As shown in the graphs, the average groundwater elevation was below the protective elevation at many wells along the barrier during FY 2014-15. However, areas of high chloride concentrations did not necessarily correlate with areas where the average elevations were below the protective elevation. A comparison of FY 2014-15 graphs with FY 2013-14 graphs indicate that overall elevations increased slightly along

the west leg, and remained constant or decreased slightly along the east leg, even though the barrier injected more water in FY 2014-15 than FY 2013-14. In all cases, the southeastern portion of the barrier remained below protective elevations due to the limited injection capabilities in this area (i.e. quantity of wells, pressure limitations, maintenance, repairs, etc.). It is important to note that the JMC is seeking to remediate injection capabilities in the southeastern region through additional wells, modeling studies, grouting operations, and condition assessments to plan for and minimize shutdowns.

CHLORIDES

Figures 9 through 13 (pp. 22-26) show chloride concentrations trends over the past 10 years for each aquifer zone. The graphs plot the average of every maximum value measured at each observation well during each sampling event within the target area (i.e., east or west of the San Gabriel River) with respect to the freshwater condition (250mg/L). The data includes all available information from the annual and semi-annual chloride sampling events for wells along the barrier alignment and landward for approximately 2,000 feet from the barrier. As a result, the semi-annual values are “weighted” more heavily than the annuals in the calculation of the annual average.

Figure 9a: R-Zone Chloride West of San Gabriel River

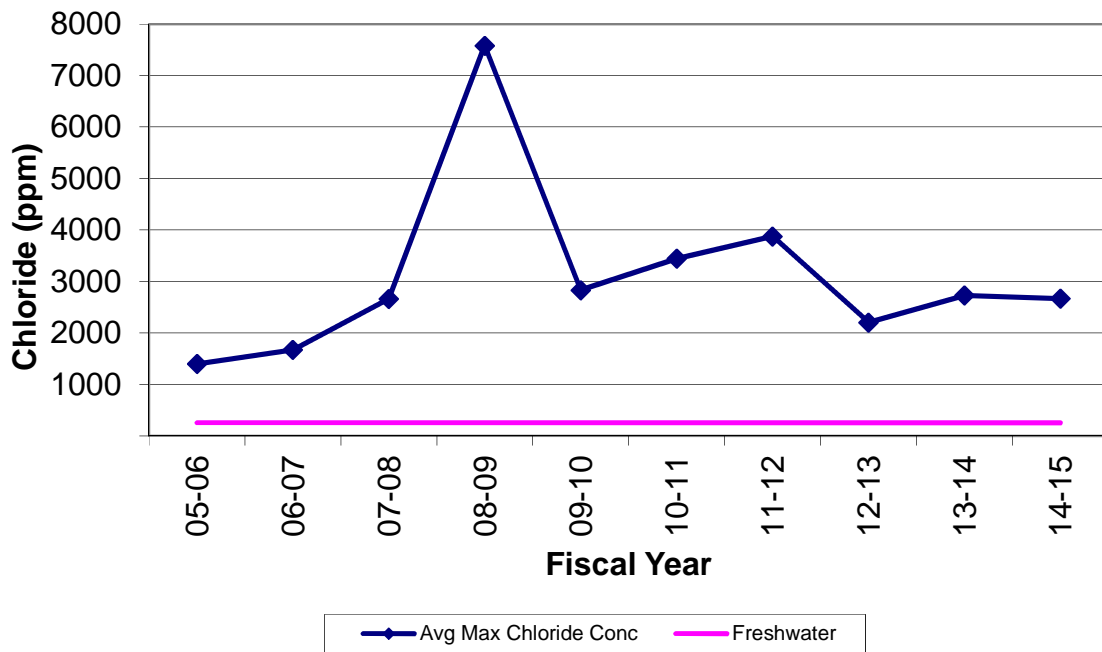


Figure 9b: R-Zone Chloride East of San Gabriel River

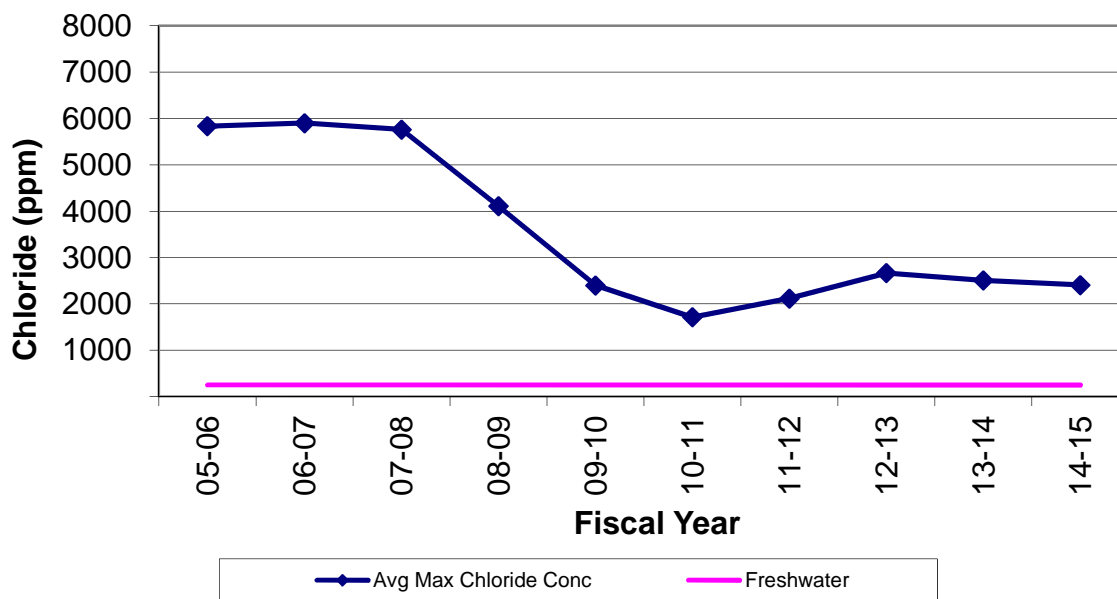


Figure 10a: C-Zone Chloride West of San Gabriel River

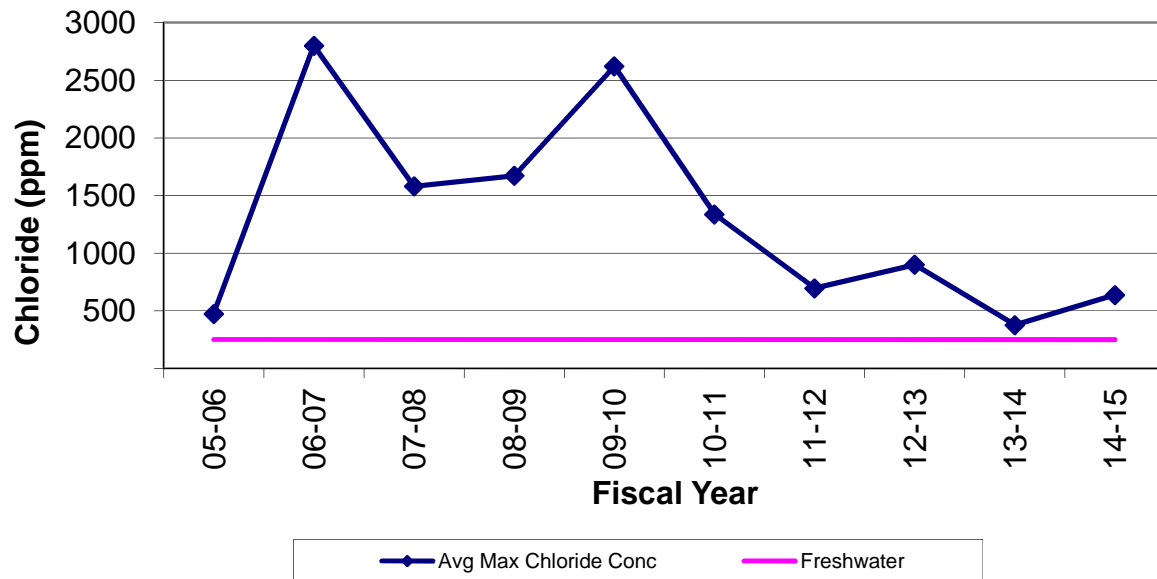


Figure 10b: C-Zone Chloride East of San Gabriel River

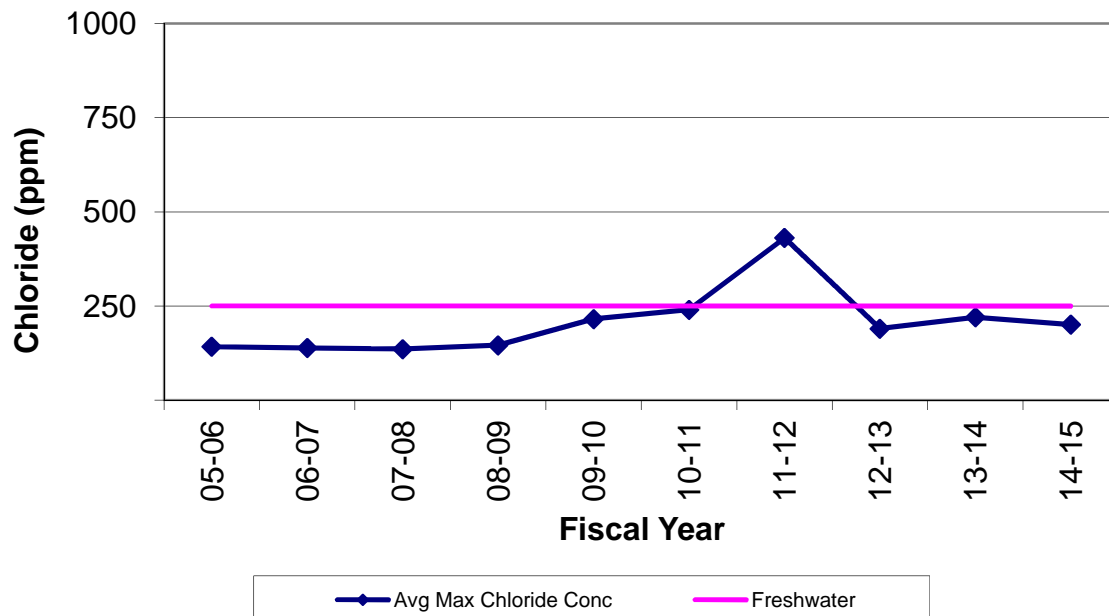


Figure 11a: B-Zone Chloride West of San Gabriel River

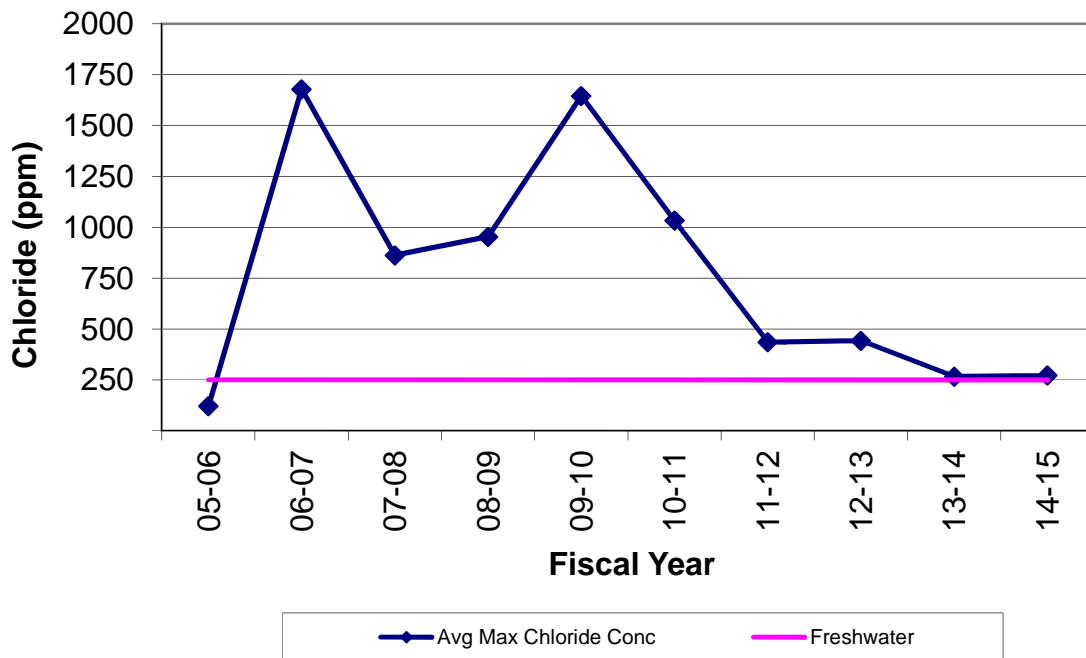


Figure 11b: B-Zone Chloride East of San Gabriel River

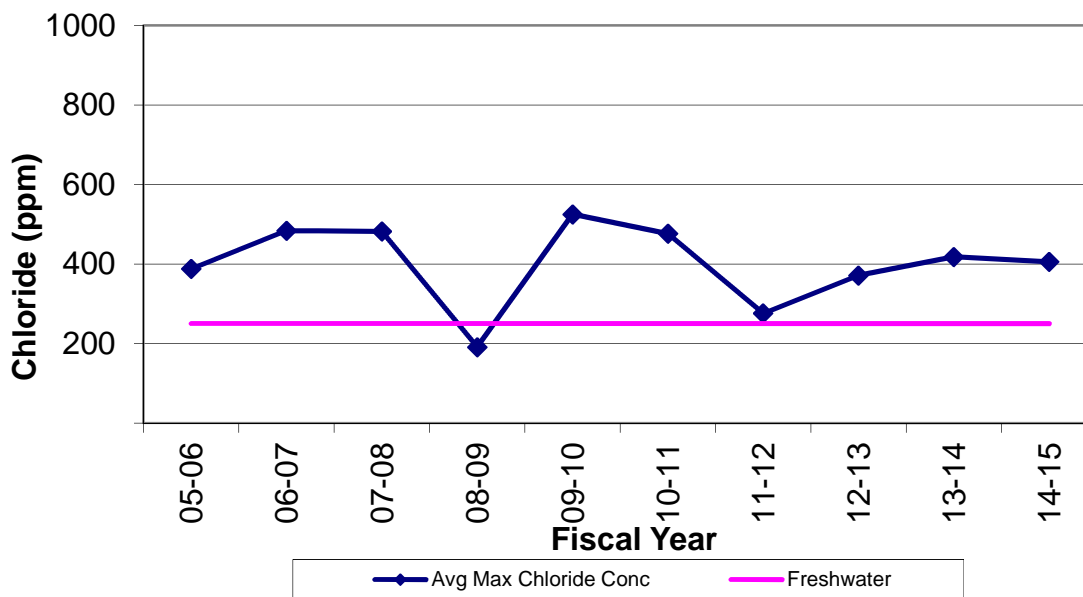


Figure 12a: A-Zone Chloride West of San Gabriel River

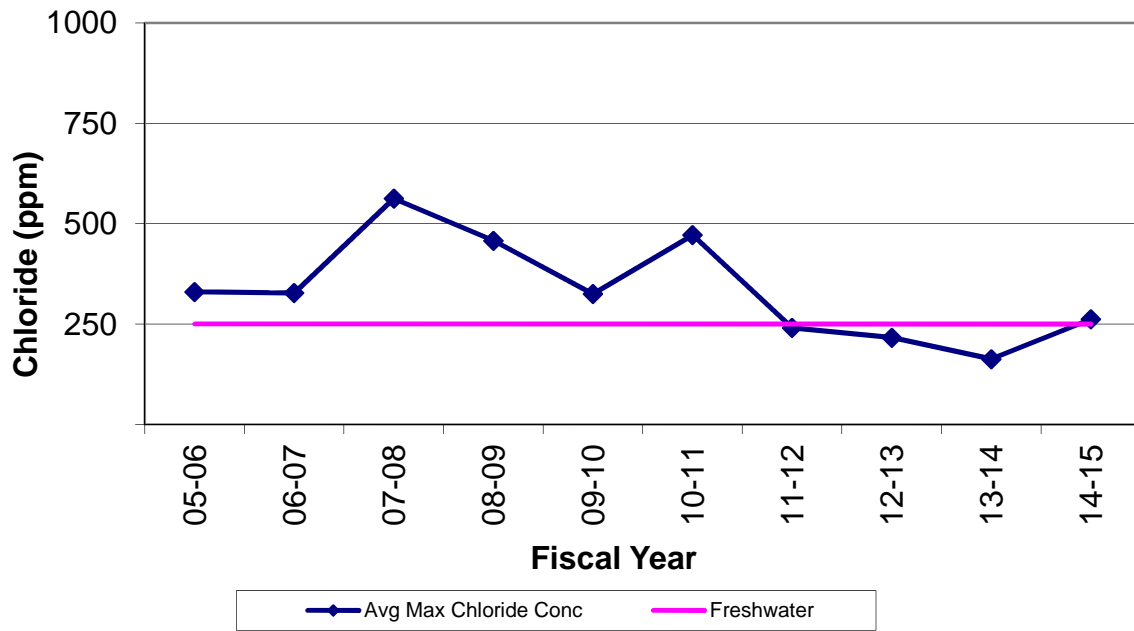


Figure 12b: A-Zone Chloride East of San Gabriel River

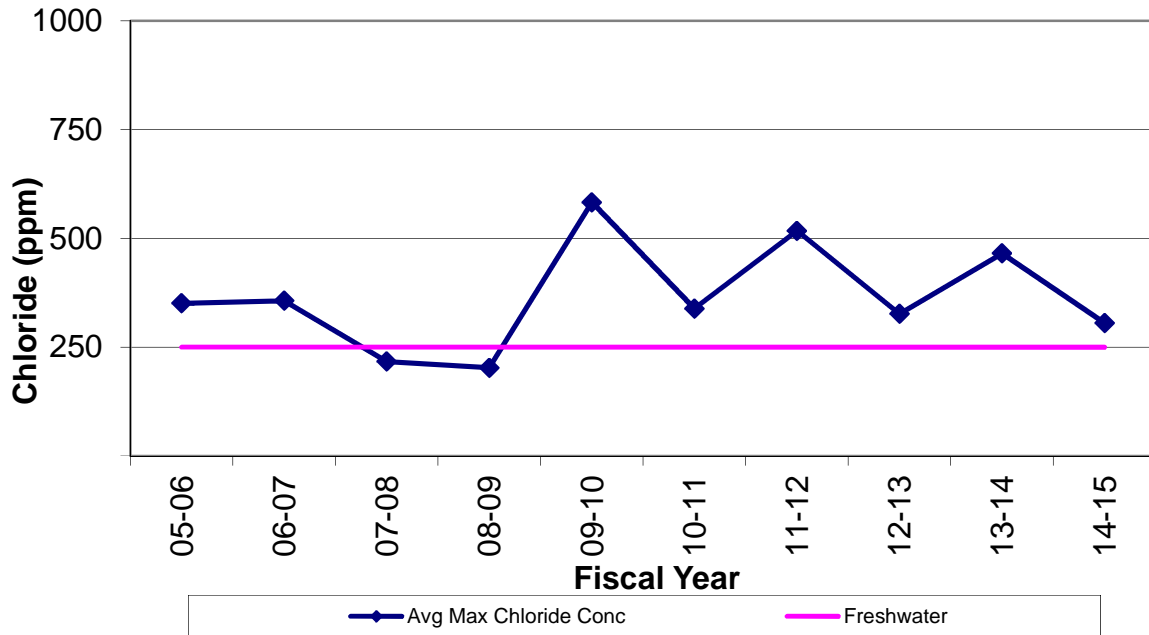


Figure 13a: I-Zone Chloride West of San Gabriel River

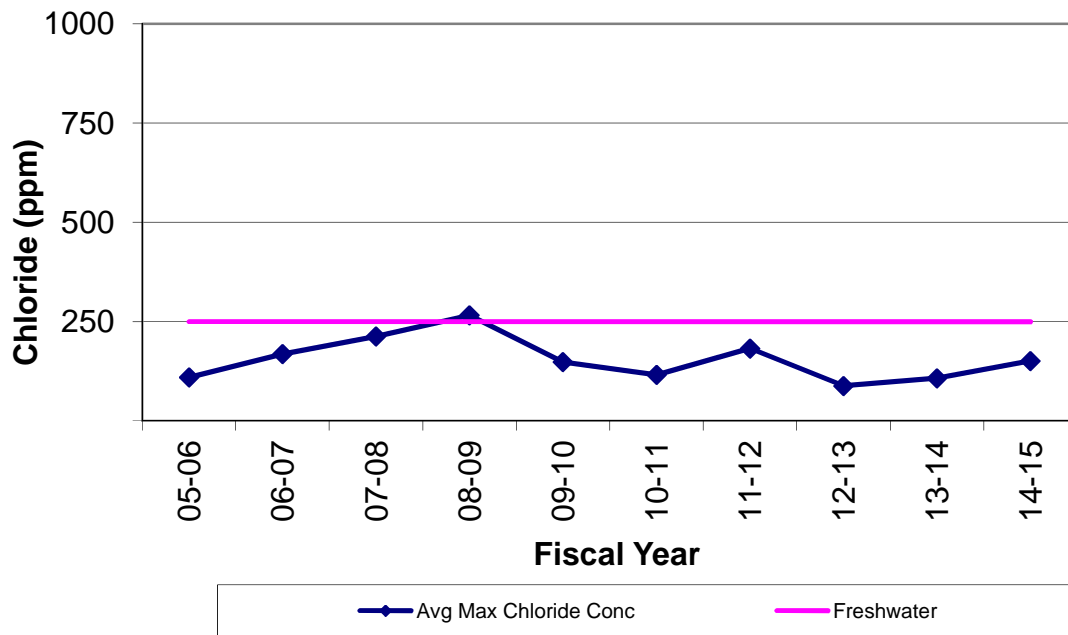
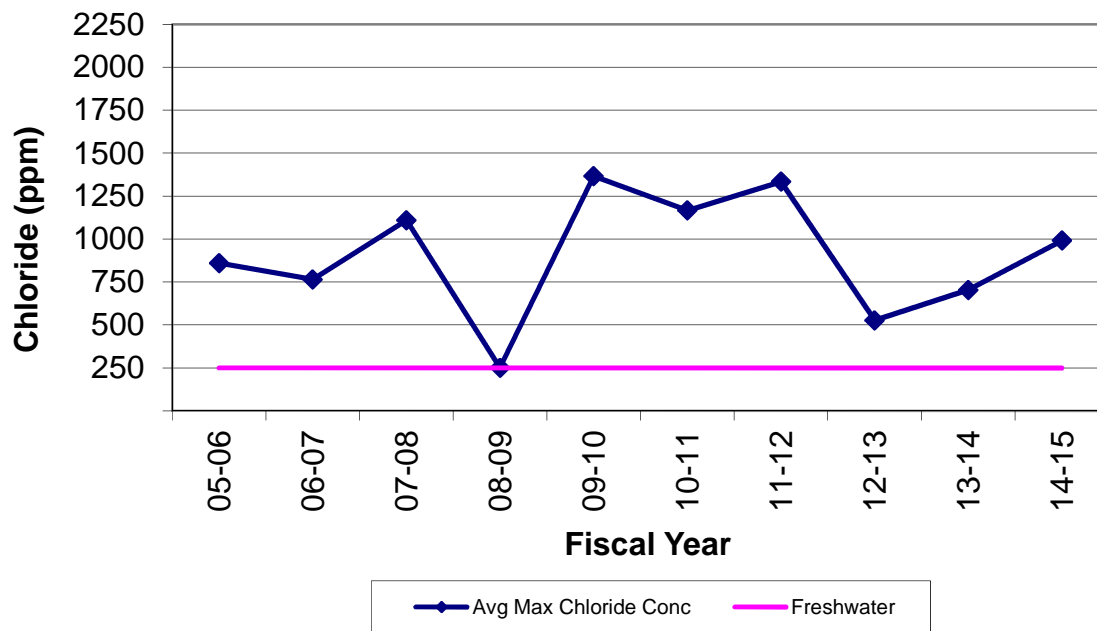


Figure 13b: I-Zone Chloride East of San Gabriel River



West of the San Gabriel River, FY 2014-15 average maximum chloride concentrations in the C, A and I Zones increased. The increase was greater than 250 mg/L in the C zone. Average maximum chloride concentration in the B Zone showed a slight increase, while the average maximum concentration decreased significantly in the R zone.

East of the San Gabriel River, FY 2014-15 average maximum chloride concentrations decreased slightly in the C, and B zones, and showed decreases of approximately 100 and 160 mg/L in the R and A Zones, respectively. However, the average maximum chloride concentration increased dramatically in the I Zone.

Chloride concentration contour maps for the R, C, B, A, and I Zones have been prepared from data collected in the Spring of 2015 and are included in Appendix A-6.1, A-7.1, A-8.1, A-9.1, and A-10.1, respectively. The chloride contour maps are based on the maximum chloride ion concentration (mg/L) measured at each observation well. Chloride data was gathered from observation wells located within the immediate vicinity of the barrier and does not represent basin-wide conditions for the groundwater basin protected by the barrier. Wells with chloride concentrations of 250 mg/L or less were considered fresh. The chloride measurements used in this report were taken during the annual event in February and March 2015 and the semi-annual sampling event in March and April 2015.

Contours of **changes** in chloride concentration for the R, C, B, A, and I Zones between Spring 2014 and Spring 2015 are shown in Appendices A-6.2, A-7.2, A-8.2, A-9.2, and A-10.2. Available data for Spring 2014, which was then subtracted from the corresponding and available data for Spring 2015. These contours very clearly identify areas where chloride concentrations increased and decreased between these two reporting periods.

The chloride concentration contours for FY 2014-15 are similar in shape and pattern to

those of the previous year. The current contours and the corresponding chloride concentration cross-section (A-11) for this reporting period indicate that intrusion of seawater across the barrier continued to be controlled west of the San Gabriel River. East of the San Gabriel River, several areas recorded elevated chloride concentrations. Additional areas of high chloride concentrations and/or notable changes in concentration (since the FY 2013-14 report) are as follows:

- R Zone – High chloride concentrations continued to remain present and increase north of the west leg along Los Cerritos Channel and in the immediate vicinity of well 34L'1 on the east leg. Chloride concentrations increased on the order of 1,000 and 2,000mg/L at wells 33S18 and 33Y10, respectively. Concentrations decreased significantly at well 34F5.
- C Zone – Elevated chloride concentrations north of the ABP near Los Cerritos Channel continued to increase, with increases on the order of 500 mg/L at wells 33T13 and 33U11, and 1000 mg/L at well 33S18. While chloride concentrations remained low along most of the east leg, elevated concentrations remained near observation wells 34T0.1 and 35K1 during FY 2014-15. Elevated chlorides were also observed east of the Barrier at OCWD wells BS21/2 and BS14/2.
- B Zone – West of the Los Cerritos Channel, chloride concentrations remained constant from the previous reporting period along the ABP alignment. Further west of the barrier, chloride concentrations remained extremely high and even increased dramatically at well 32Z'5. Chloride concentrations also remained significantly elevated at well 33Q15. Along the east leg of the barrier, chloride concentrations at well 34JL remained elevated, consistent with previous reporting periods. While decreasing slightly during the FY 2014-15 reporting period, elevated chloride concentrations continue to be present in the area surrounding well 34U8.
- A Zone – The high chloride concentrations northwest of the ABP's west leg continued to be present and actually increased at well 33L23. Additional increases of 3500 mg/L and 6,000 mg/L seaward and west of the ABP were observed at new ABP wells 32V'10 and 32Z'5, respectively. Chloride

concentrations have also increased significantly between the Los Cerritos and Los Alamitos Channels, particularly at wells 33U'3, 34DG and 34D'6. Well 34DG exhibited a significant increase in chloride concentration, after a large decrease in chloride concentration from the previous year. Chloride concentrations increased consistently along and landward of the east leg of the ABP, with the exception of wells 34HJ, 35H11, and a significant decrease of approximately 1,300 mg/L at well 35H12.

- I Zone – Chloride concentrations remained below 250 mg/L along the west leg and northward of the barrier, with the exception of wells 33X10 and 33Z11 which remain elevated. Along the east leg of the barrier, chloride concentrations remained elevated at well 35H25 while decreasing dramatically at 34LS after a dramatic increase was reported in FY 2013-14. Chloride concentrations increased significantly at wells 34JL and 35E0.1, and consistent high concentrations at 35F20 continued.

There continue to be three possible causes of the high chloride concentrations in all zones to the north, northwest, and along portions of the ABP west leg (which was in steady operation during this reporting period). These include the remaining seawater from previous intrusions, migration of seawater inland through the Los Cerritos Channel, and suspected intrusion around the west end of the barrier. Elevated chloride concentrations in the area immediately north of the west leg and west of the Barrier will continue to be monitored using the new observation wells constructed by LACDPW in the 2012-13 reporting period.

OCWD is in the process of improving the north-south ABP alignment adjacent to the Los Cerritos Channel with the installation of 17 new clustered injection wells. OCWD is also planning the installation of four multi-depth observation wells along the ABP east leg to improve the monitoring well network in that area.

BARRIER PROJECT COSTS

This section of the report is divided into four parts: Water Costs, Operation and Maintenance Costs, Fixed Asset Costs, and Budget. Under the terms of the 1964 Cooperative Agreement between LACFCD and OCWD, fixed assets are typically divided into facilities paid for by the LACFCD, facilities paid for by the OCWD, and joint facilities paid for by both agencies, depending on their location. Under the same agreement, water costs are divided between the LACFCD (whose portion is paid by the WRD per a separate agreement) and the OCWD. The total cost of the ABP in FY 2014-15 was \$9,149,572, which can be broken down as follows: water costs of \$7,335,803, Operations and Maintenance costs of \$1,691,837, Special Program costs of \$50,022, and \$71,910 for joint liability insurance.

WATER COSTS

During FY 2014-15, 7,113.1 acre-feet of water were injected at an estimated total cost of \$7,335,803. The monthly unit water cost (dollars per AF) from July 2014 to June 2015 varied periodically as shown in Table 1. The monthly quantity of water injected and total water costs paid by each agency are shown below in Table 2.

TABLE 2. QUANTITY OF WATER INJECTED AND COSTS

MONTH	AMT BY WRD (AF)	AMT BY OCWD (AF)	TOTAL AMT (AF)
Jul-14	437.6	244.0	681.6
Aug-14	461.9	245.6	707.5
Sep-14	480.8	247.6	728.4
Oct-14	441.1	256.5	697.6
Nov-14	495.9	217.3	713.2
Dec-14	470.6	241.1	711.7
Jan-15	417.5	200.6	618.1
Feb-15	328.0	99.1	427.1
Mar-15	324.6	101.9	426.5
Apr-15	293.4	99.4	392.8
May-15	365.1	132.0	497.1
Jun-15	360.4	151.1	511.5
TOTAL INJECTED	4,876.9	2,236.2	7,113.1
TOTAL COST (\$) [From Tbl. 1]	\$ 5,034,117	\$ 2,301,686	\$7,335,803

**TABLE 3. DISTRIBUTION OF OPERATIONS AND MAINTENANCE COSTS FOR
INJECTION AND EXTRACTION ACTIVITIES**

ITEM	LOS ANGELES COUNTY	ORANGE COUNTY	TOTAL
Operations and Maintenance of Injection Facilities (including Observation Wells) ¹	\$1,167,341	510,783	\$1,678,124
Operations & Maintenance of Extraction Facilities ²	\$13,714	\$0	\$13,714
Special Programs ³	\$50,022	\$0	\$50,022
SUBTOTAL	\$1,231,077	\$510,783	\$1,741,860
Liability Insurance	\$35,955	\$35,955	\$71,910
TOTAL	\$1,267,032	\$546,738	\$1,813,770

The values in Table 3 come from the ABP FY 2014-15 Costs (see A-19) as follows:

¹ The sum of Items 1, 2, 3, 7, 8, 9, 10, 11, 12, 14, and 15. OCWD is responsible for 31.4% of all costs for these items except for Item 10 (flat \$375 per Agreement)

² The sum of Items 4, 5, and 6. OCWD is not responsible for any portion of the cost for these items.

³ Item 13. OCWD is not responsible for any portion of the cost for this item unless pre-arranged

OPERATIONS AND MAINTENANCE COSTS

A total of \$1,741,859 was spent on Operations and Maintenance and special programs during FY 2014-15. Pursuant to the 1964 Cooperative Agreement, the OCWD pays a percentage of the applicable operations and maintenance costs for injection operations proportional to the percentage of the total amount of injection water paid for by the OCWD. The distribution of FY 2014-15 operations and maintenance costs is summarized in Table 3.

The yearly cost of Operations and Maintenance (including special programs but excluding water and extraction costs) for the last 20 years of ABP operations are shown in Table 4.

TABLE 4. COSTS OF SERVICES AND SUPPLIES FOR INJECTION

Fiscal Year	Volume of Water Injected (AF)	Total Cost	Cost Per AF Injected
1995-96	5,269.0	\$509,377	\$96.67
1996-97	5,739.4	\$408,064	\$71.10
1997-98	5,335.8	\$923,342	\$173.05
1998-99	5,330.4	\$795,044	\$149.15
1999-00	6,077.9	\$589,168	\$96.94
2000-01	5,398.8	\$961,649	\$178.12
2001-02	6,061.7	\$713,299	\$117.67
2002-03	5,012.3	\$1,555,921	\$310.42
2003-04	5,879.7	\$730,652	\$124.27
2004-05	5,066.1	\$918,020	\$181.21
2005-06	3,457.8	\$1,605,456	\$464.30
2006-07	1,265.1	\$2,309,300	\$1,825.39
2007-08	5,971.1	\$3,513,957	\$588.49
2008-09	7,936.2	\$1,875,902	\$236.37
2009-10	5,629.2	\$3,135,608	\$557.03
2010-11	5,066.1	\$2,830,801	\$558.77
2011-12	4,334.7	\$2,368,788	\$546.47
2012-13	5,490.4	\$2,477,565	\$451.25
2013-14	6,692.3	\$3,605,859	\$538.81
2014-15	7,113.1	\$1,728,125	\$242.95

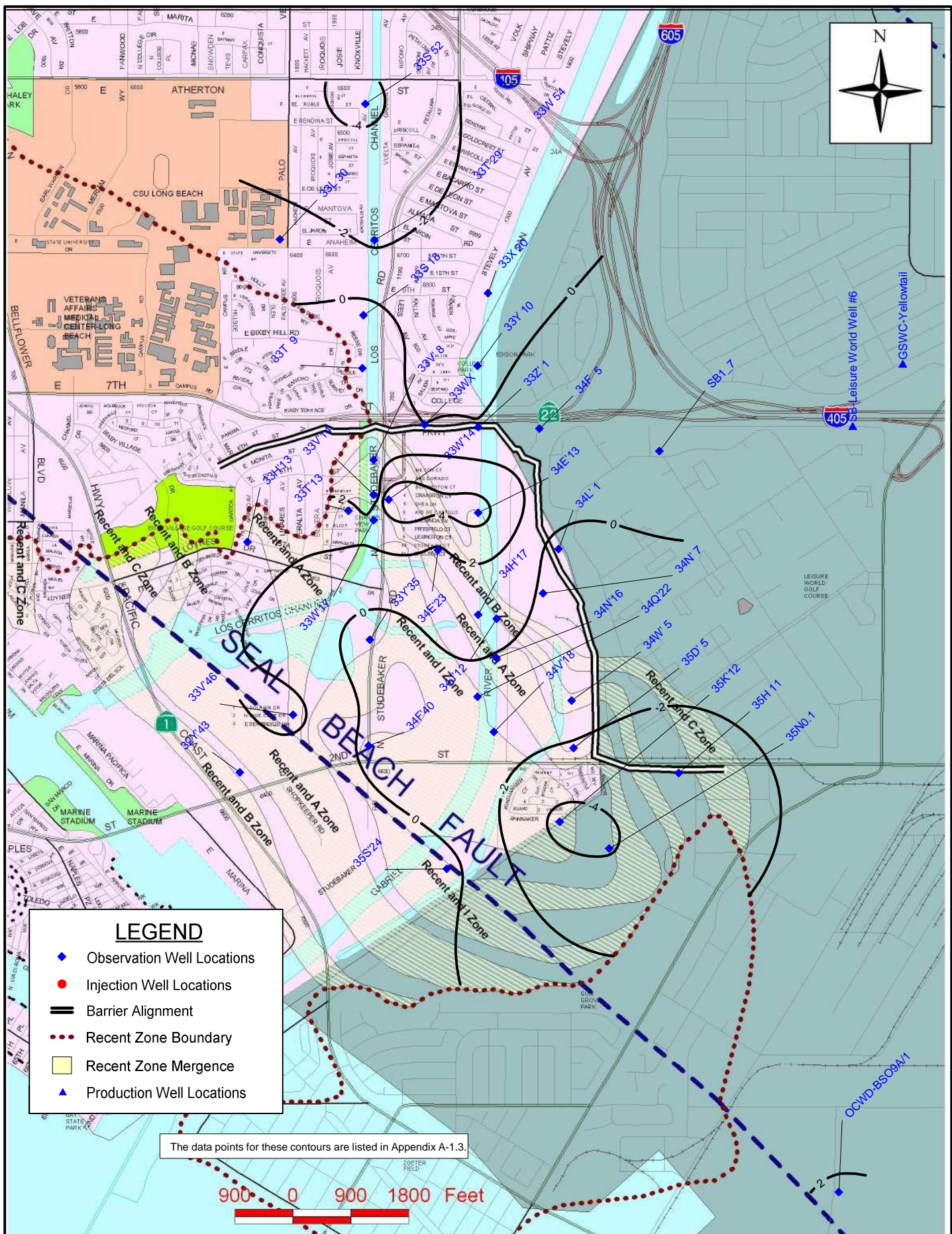
FIXED ASSET COSTS

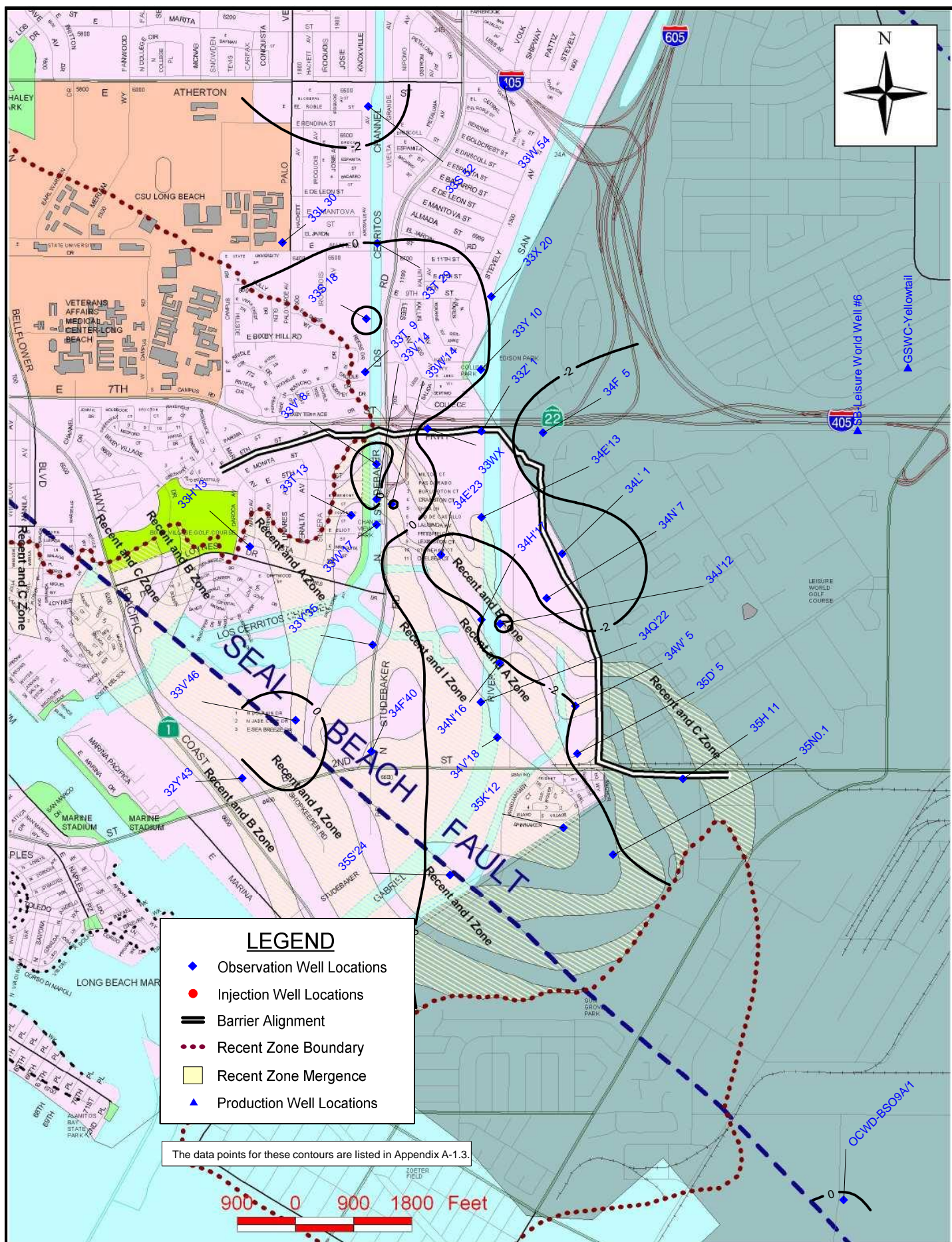
During Fiscal Year 2014-15, there were no new LACFCD facilities, OCWD facilities, or joint facilities added to the ABP. However, design was completed for new OCWD facilities (Unit 14 injection and observation wells) and OCWD advertised the project during the FY 2014-15 reporting period.

BUDGET

The FY 2016-17 budget for the ABP Operations, Maintenance and fixed Assets Costs is \$1,916,000. A breakdown of this amount, along with past expenditures per category, is shown in Appendix A-20. Note that amounts for WRD are shown in addition to those for LACFCD and OCWD.

APPENDIX





ALAMITOS BARRIER PROJECT
R-Zone
Groundwater Elevation Data for Contours and Tables

POINT	PROJ	FCD	AQUIFER	DATE	FY 14-15 ELEV	P.E. ¹	Δ^2	FY 13-14 ELEV	CHANGE IN ELEV
1	32Y'43	493WW	R	20150312	0.8			0.7	0.1
2	33H'13	493YY	R,A	20150226	2.4			1.4	1.0
3	33L 30	491G	R	20150224	-1.0			-0.4	-0.6
4	33S 18	492AH	R	20140923	0.6			1.0	-0.4
5	33S 52	491J	R	20140923	-4.5			-1.7	-2.8
6	33T 9	492CV	R	20150319	0.4			-0.6	1.0
7	33T 29	491D	R	20150302	-2.3			-2.3	0.0
8	33T'13	492AU	R	201500226	2.8			1.6	1.2
9	33V' 8	492BY	R	20150225	1.4			1.7	-0.3
10	33V'14	492HH	R,A	20150325	0.1			1.0	-0.9
11	33V'46	493UU	R	20150312	2.6			3.2	-0.6
12	33W 54	501C	R	20150224	-0.9			-0.6	-0.3
13	33W'14	492AT	R	20150225	6.2			3.7	2.5
14	33W'17	493PP	R	20150224	2.1			1.9	0.2
15	33WX	502AZ	R	20150310	0.0			0.1	-0.1
16	33X 20	502L	R	20150312	-0.5			-0.4	-0.1
17	33Y 10	502BA	R	20150224	-0.2			-0.4	0.2
18	33Y'35	493AB	R	20150303	-1.2			-3.0	1.8
19	33Z' 1	502AU	R	20150312	0.1			0.9	-0.8
20	34E'13	503AU	R	20150312	4.9			6.0	-1.1
21	34E'23	503X	R	20150312	1.7			5.1	-3.4
22	34F 5	502BT	R	20150312	0.8			4.1	-3.3
23	34F'40	483J	R	20150311	-0.4			-0.9	0.5
24	34H'17	503Y	R	20150312	1.2			3.0	-1.8
25	34J'12	503U	R	20150303	0.6			5.4	-4.8
26	34L' 1	503P	R	20150311	-0.8			0.3	-1.1
27	34N' 7	503AE	R	20150312	-0.2			1.4	-1.6
28	34N'16	503W	R	20150326	-0.1			1.6	-1.7
29	34Q'22	503T	R	20150312	-0.4			1.0	-1.4
30	34V'18	503V	R	20141008	-1.0			-0.2	-0.8
31	34W' 5	503AH	R	20150310	-1.0			1.0	-2.0
32	35D' 5	503AL	R	20140925	-2.2			0.0	n/a
33	35H 11	514F	R	20150330	-3.0			0.0	n/a
34	35K'12	504R	R	20150311	-4.6			-3.4	-1.2
35	35N0.1	504M	R	20150309	-4.1			-2.2	-1.9
36	35S'24	504K	R	20150312	0.6			0.7	-0.1
37	OCWD- BSO9A/1		R	20150305	2.2			2.2	0.0
38	SB1_7		R	20150312	1.5				n/a

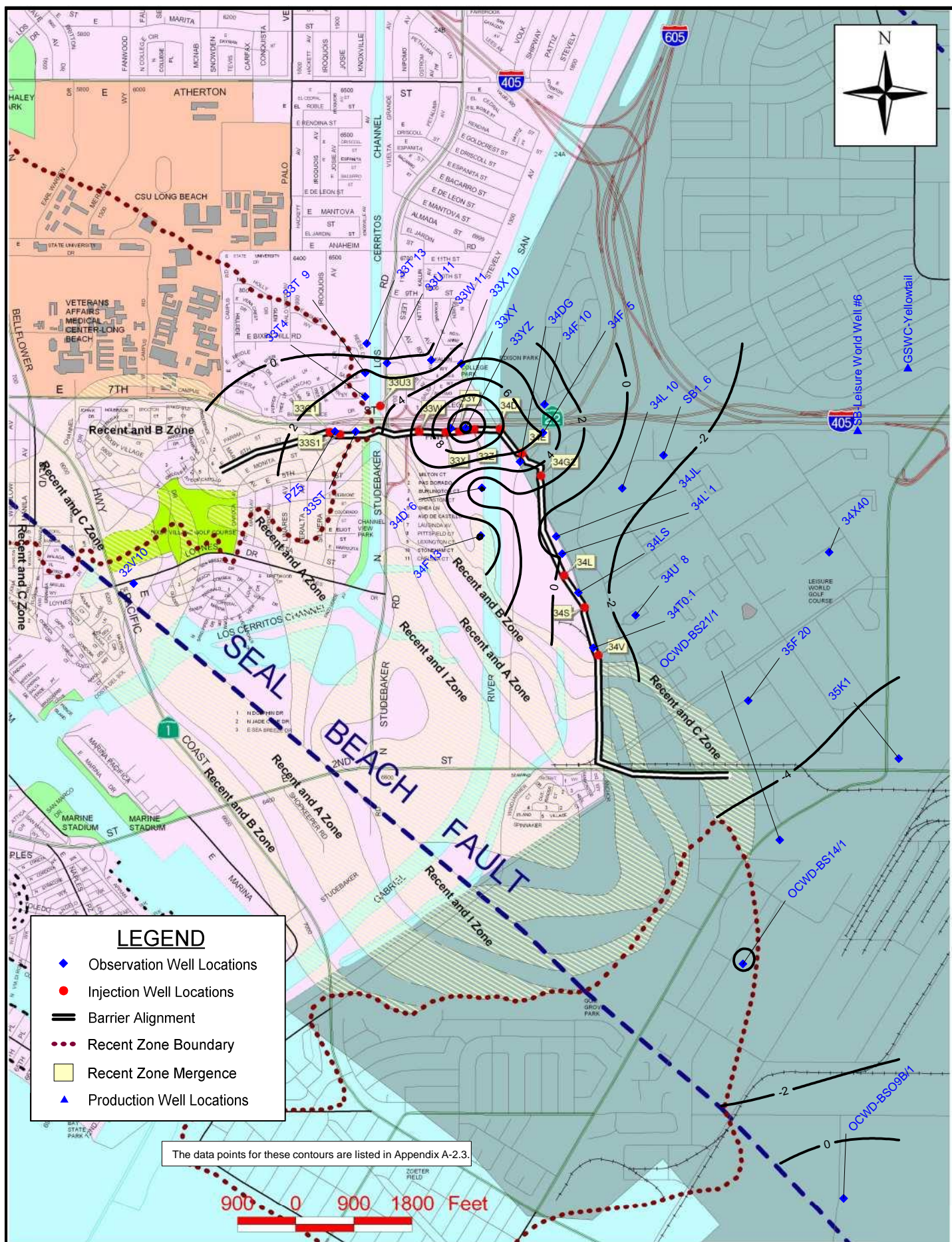
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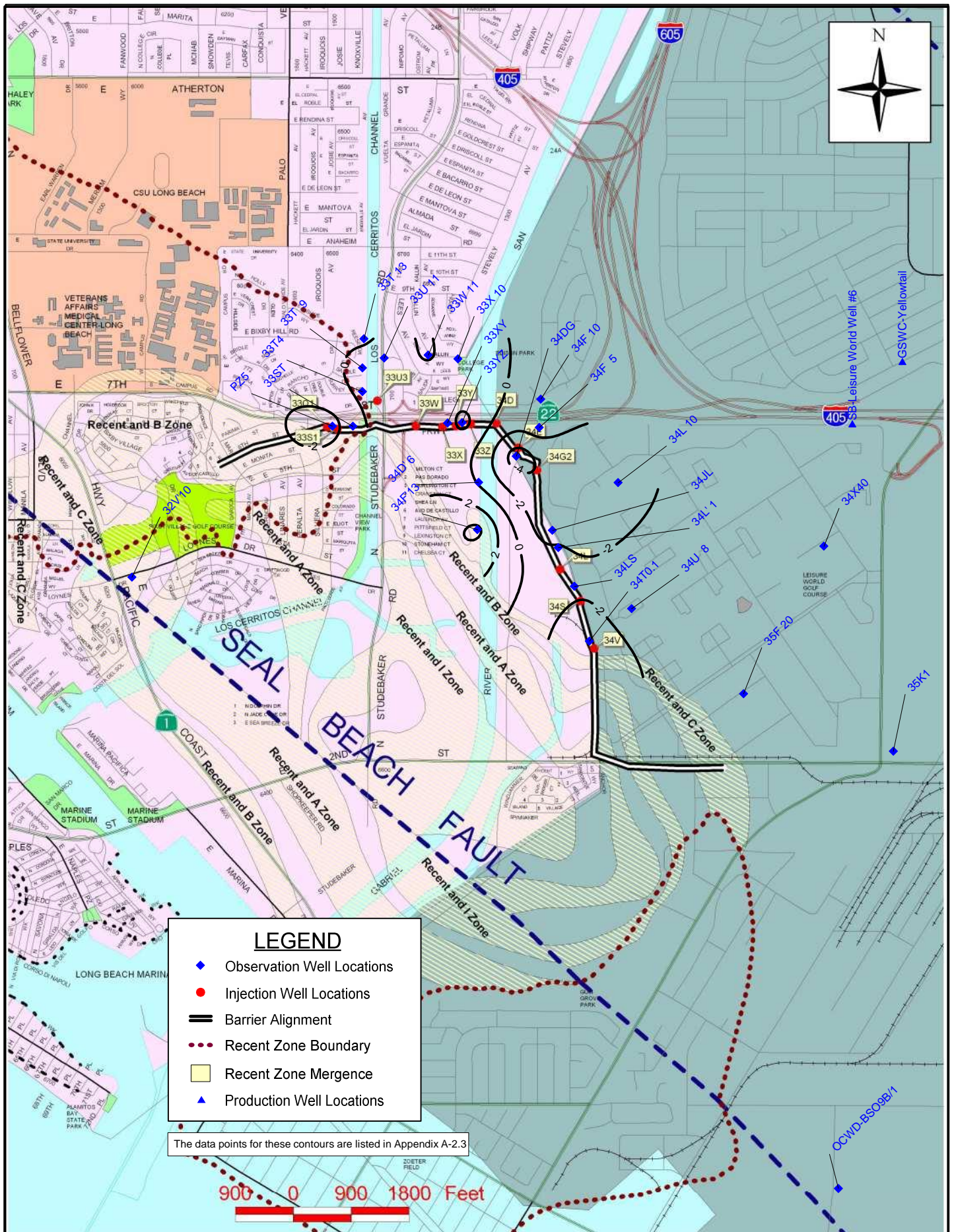
¹ P.E. represents the protective elevations calculated for internodal wells.

² Δ (+/-) represents how much groundwater level is above/below respective P.E.

 = A max. or min. elevation during that period.



Alamitos Barrier Project
C Zone Groundwater Elevation (ft) Contours Spring 2015



ALAMITOS BARRIER PROJECT
C-Zone
Groundwater Elevation Data for Contours and Tables

POINT	PROJ	FCD	AQUIFER	DATE	FY 14-15 ELEV	P.E. ¹	Δ^2	FY 13-14 ELEV	CHANGE IN ELEV
1	32V'10	483H	C	20150219	-1.1			-1.8	0.7
2	33ST	492BK	C,B	20150310	2.4	0.9	1.5	3.0	-0.6
3	33T4	492CT	C	20150312	3.1			2.6	0.5
4	33T 9	492CU	C	20150312	2.5			1.4	1.1
5	33T 13	492AC	C	20150323	-1.9			-1.5	-0.4
6	33U 11	492AL	C	20150323	0.4			-0.9	1.3
7	33W 11	502R	C	20150324	0.3			0.6	-0.3
8	33X 10	502BB	C	20150312	4.1			2.8	1.3
9	33XY	502BL	C	20150518	10.3	5.4	4.9	9.3	1.0
10	33YZ	502AB	C	20150331	12.9	5.4	7.5	10.2	2.7
11	34D' 6	502BF	C	20150312	-0.3			-0.1	-0.2
12	34DG	502X	C	20150331	5.2	5.4	-0.2	10.4	-5.2
13	34F 5	502BU	C	20150312	6.0			6.9	-0.9
14	34F 10	502AP	C	20150323	3.0			4.5	-1.5
15	34F'13	503R	C	20141008	6.2			1.7	4.5
16	34JL	503AR	C	20150331	-1.9	4.2	-6.1	1.7	-3.6
17	34L' 1	503N	C	20150311	0.0	4.8	-4.8	1.7	-1.7
18	34L 10	502AK	C	20150312	-1.4			1.1	-2.5
19	34LS	503BF	C	20150311	-1.4	4.5	-5.9	0.4	-1.8
20	34T0.1	503AB	C	20150311	-1.0	3.6	-4.6	2.6	-3.6
21	34U 8	513D	C	20150312	-2.5			-1.9	-0.6
22	34X40	513R	C	20150406	-3.0			-2.0	-1.0
23	35F 20	513L	C	20150326	-2.6			-1.3	-1.3
24	35K1	523D	C	20150311	-4.7	4.3	-9.0	-4.4	-0.3
25	PZ5	492CH	C,B	20150219	3.3			6.1	-2.8
26	SB1_6		C	20150312	-1.7				n/a
27	OCWD- BSO9B/1		C	20150305	1.8			2.0	-0.2
28	OCWD- BS14/2		C	20150409	-6.2				n/a
29	OCWD- BS21/2		C	20150409	-4.7				n/a

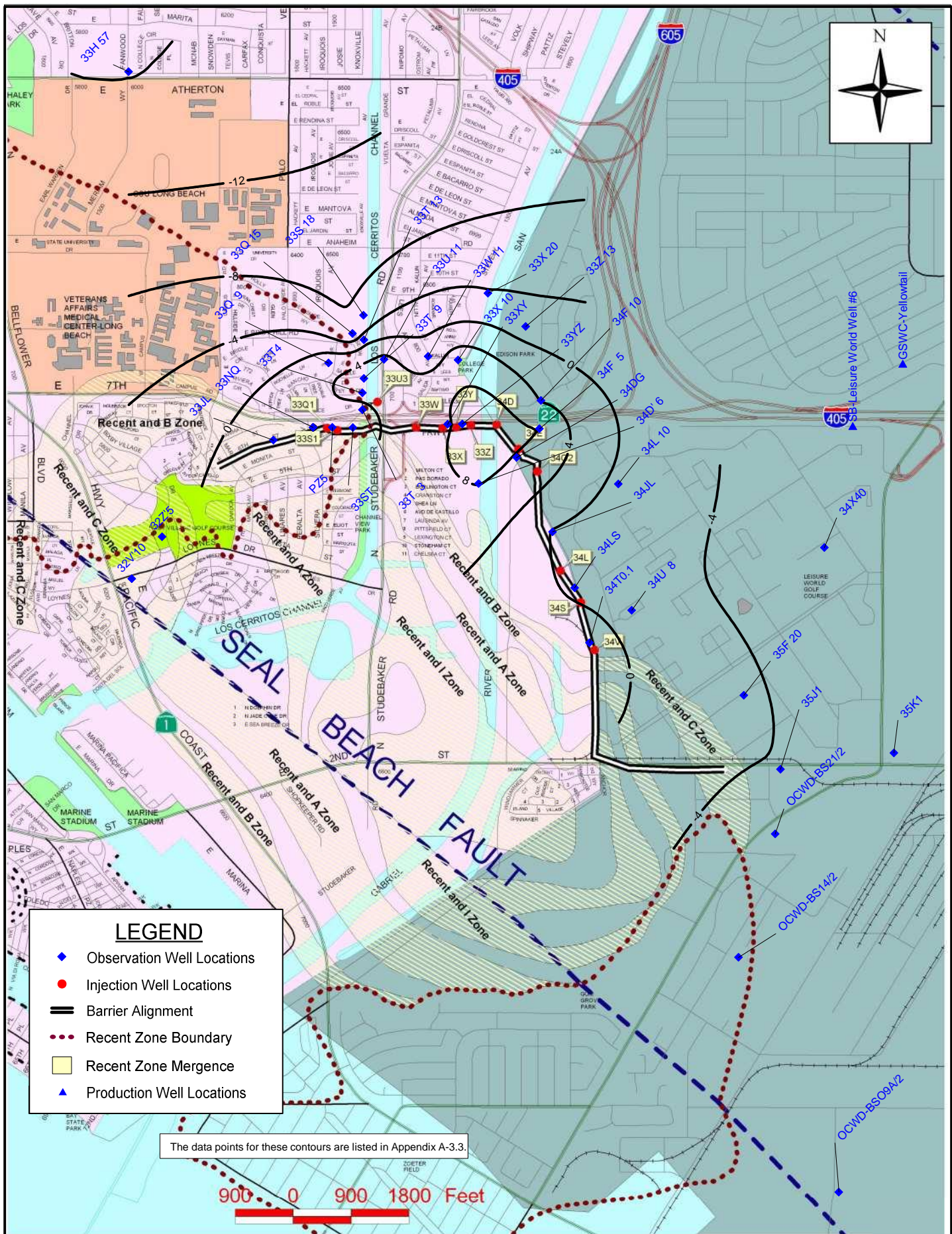
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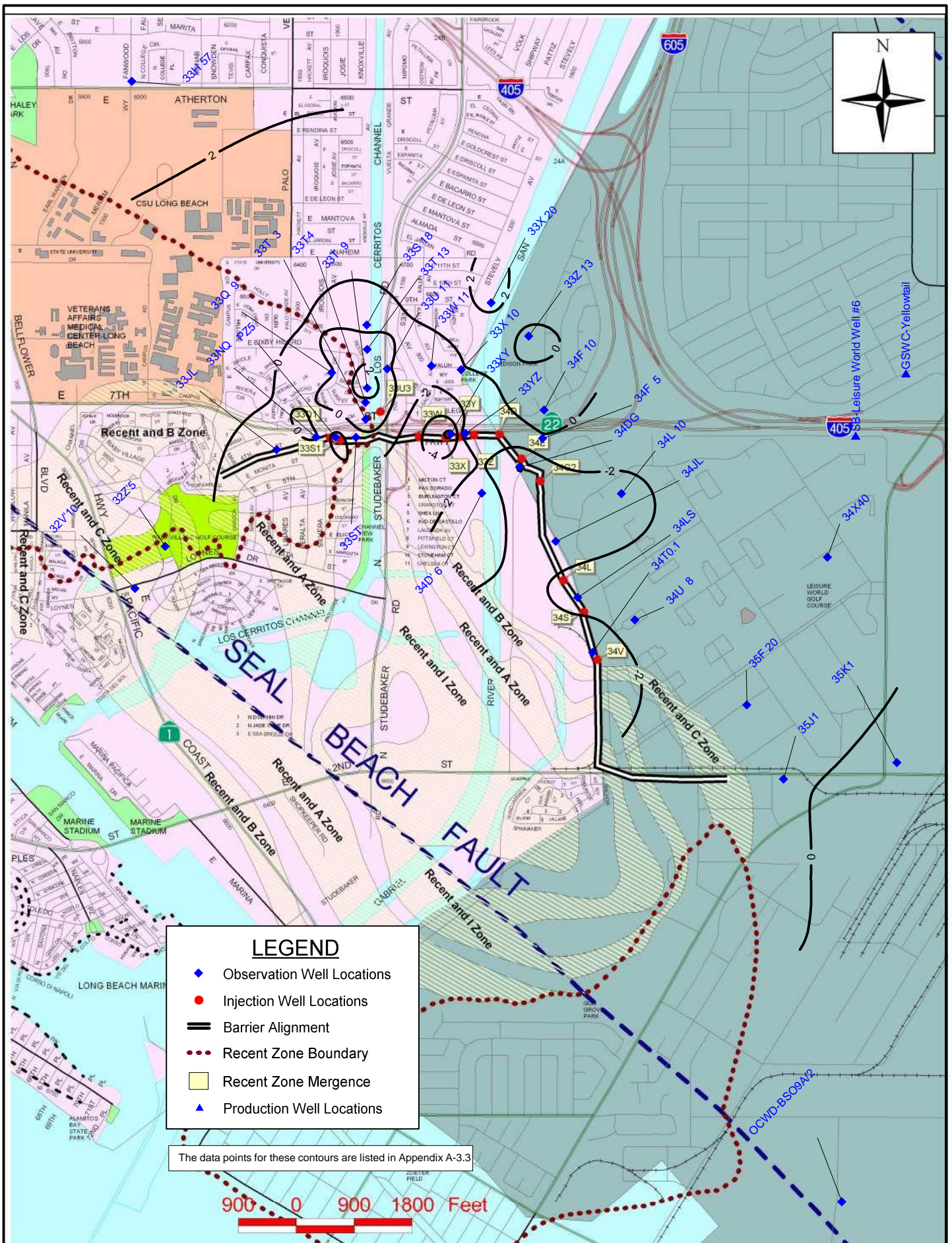
¹ P.E. represents the protective elevations calculated for internodal wells.

² Δ (+/-) represents how much groundwater level is above/below respective P.E.

 = A max. or min. elevation during that period.



Alamitos Barrier Project
B Zone Groundwater Elevation (ft) Contours Spring 2015



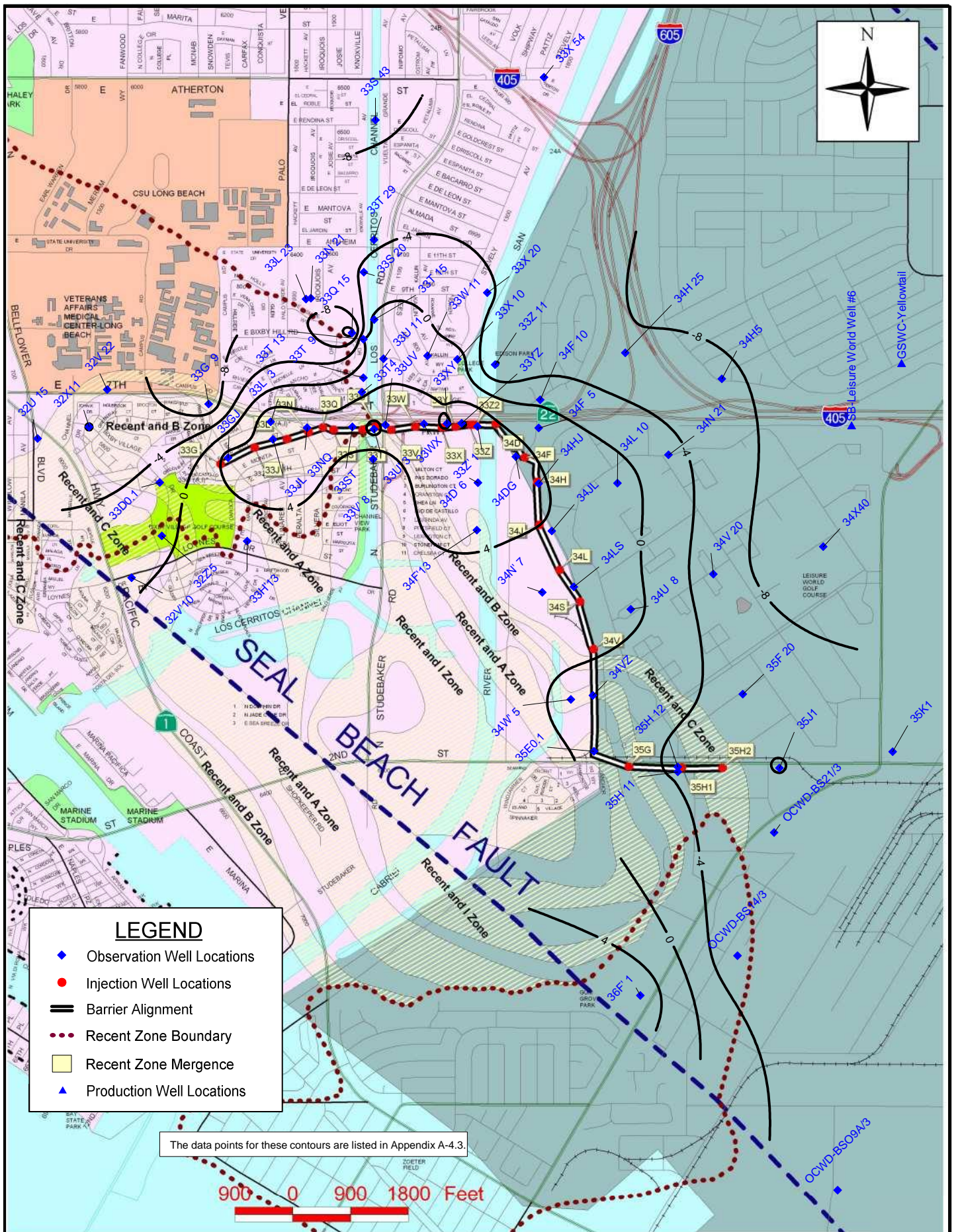
ALAMITOS BARRIER PROJECT
B-Zone
Groundwater Elevation Data for Contours and Tables

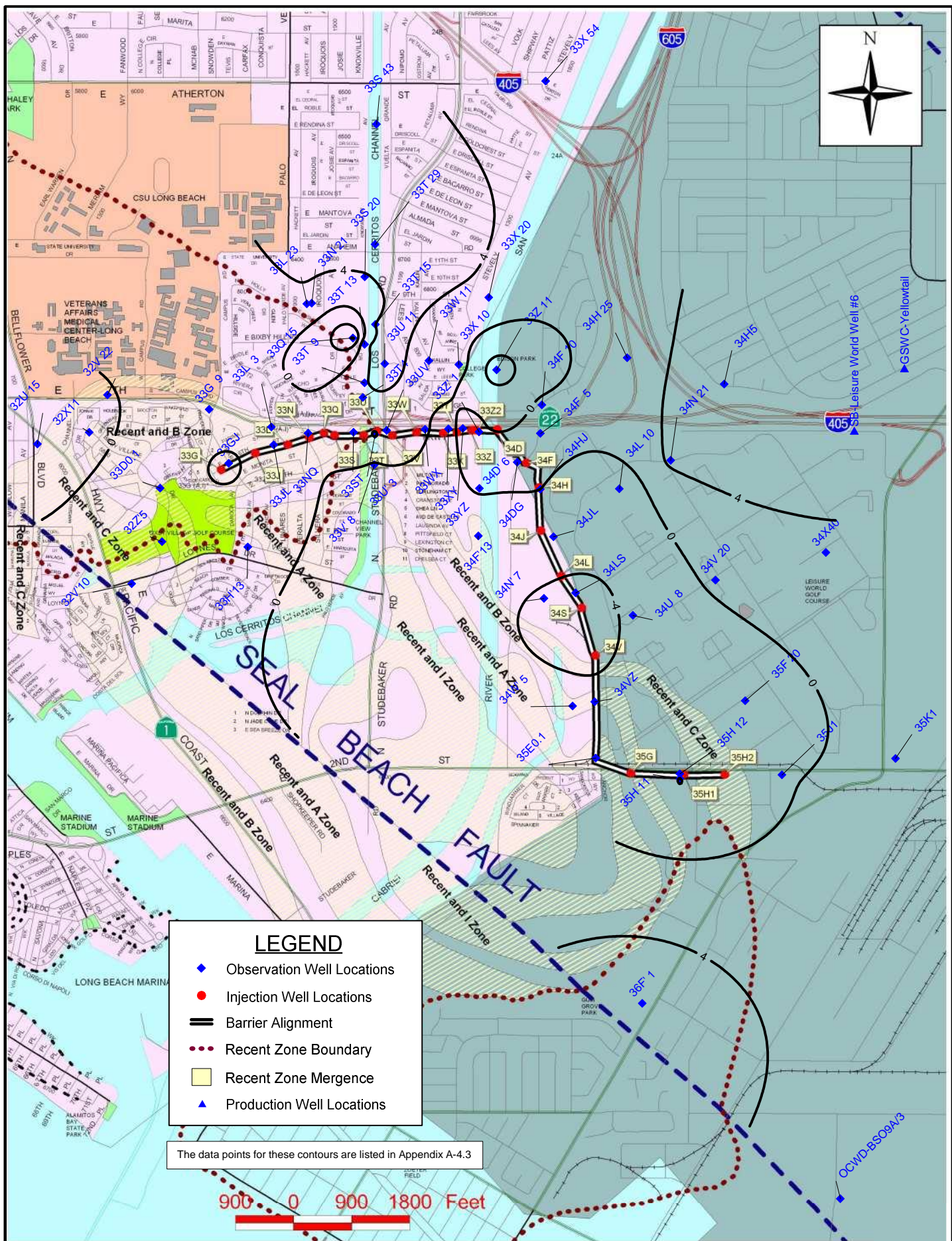
POINT	PROJ	FCD	AQUIFER	DATE	FY 14-15 ELEV	P.E. ¹	Δ ²	FY 13-14 ELEV	CHANGE IN ELEV
1	32V'10	483G	B	20140922	-1.1			-2.0	0.9
2	32Z'5	482W	B,A	20150223	-0.8			-1.4	0.6
3	33H 57	481	B	20150325	-16.2			-19.2	3.0
4	33JL	492BQ	B	20150317	2.2	0.9	1.3	2.7	-0.5
5	33NQ	492BN	B	20150317	4.1	0.7	3.4	3.9	0.2
6	33Q 9	492CM	B	20150312	2.8			3.0	-0.2
7	33Q 15	492AN	B	20150223	-7.8				n/a
8	33ST	492BK	C,B	20150310	2.4	0.9	1.5	3.4	-1.0
9	33T 3	492CL	B	20150312	3.1			1.4	1.7
10	33T4	492CS	B	20150312	5.0			3.7	1.3
11	33T 9	492YY	B	20150319	6.4			2.8	3.6
12	33T 13	492AB	B	20150323	-1.4			-3.4	2.0
13	33U 11	492AK	B	20150323	5.0			4.8	0.2
14	33W 11	502S	B	20150324	1.1			2.9	-1.8
15	33X 10	502BC	B	20150302	6.8			6.9	-0.1
16	33X 20	502K	B	20150312	-3.7			-6.3	2.6
17	33XY	502BM	B	20150414	6.8	6.3	0.5	13.5	-6.7
18	33YZ	502AC	B	20150331	11.5	7.1	4.4	12.2	-0.7
19	33Z 13	502E	B	20150325	-1.9			-1.3	-0.6
20	34D' 6	502BG	B	20150312	8.1			8.9	-0.8
21	34DG	502Y	B	20150311	7.7	6.6	1.1	12.0	-4.3
22	34F 5	502BS	B	20150312	8.0			8.2	-0.2
23	34F 10	502AQ	B	20150323	3.8			2.8	1.0
24	34JL	503AQ	B	20150311	-0.2	5.3	-5.5	2.2	-2.4
25	34L 10	502AL	B	20150312	-0.8			1.8	-2.6
26	34LS	503BE	B	20150311	-0.9	5.4	-6.3	0.7	-1.6
27	34T0.1	503AC	B	20150311	3.2	9.9	-6.7	6.3	-3.1
28	34U 8	513E	B	20150312	-3.0			-1.8	-1.2
29	34X40	513Q	B	20150406	-5.7			-5.2	-0.5
30	35F 20	513K	B	20150312	-3.6			-2.6	-1.0
31	35J1	514M	B	20150311	-4.2	5.8	-10.0	-4.1	-0.1
32	35K1	523A	B	20150311	-5.5	5.8	-11.3	-5.7	0.2
33	PZ5	492CH	C,B	20150219	3.3			6.1	-2.8
34	OCWD- BS09A/2		B	20150305	-7.0			-7.5	0.5
35	OCWD- BS14/2		B	20150409	-6.9				n/a
36	OCWD- BS21/2		B,A	20150409	-6.6				n/a
AVG=					0.4	AVG=			1.5

¹ P.E. represents the protective elevations calculated for internodal wells.

² Δ (+/-) represents how much groundwater level is above/below respective P.E.

= A max. or min. elevation during that period.





ALAMITOS BARRIER PROJECT
A-Zone
Groundwater Elevation Data for Contours and Tables

POINT	PROJ	FCD	AQUIFER	DATE	FY 14-15 ELEV	P.E. ¹	Δ^2	FY 13-14 ELEV	CHANGE IN ELEV
1	32U 15	482M	A	20150218	-5.6			-5.0	-0.6
2	32V 22	482P	A	20150219	-5.5			-5.4	-0.1
3	32V'10	483F	A	20150219	-0.4			-1.3	0.9
4	32X11	482S	A	20150316	-8.2			-7.4	-0.8
5	32Z'5	482W	B,A	20150223	-0.8			-1.4	0.6
6	33D0.1	482U	A,I	20150312	-2.4			-4.7	2.3
7	33G 9	482F	A	20150224	-10.8			-10.8	0.0
8	33GJ	482X	A	20150317	5.4	1.4	4.0	0.1	5.3
9	33H'13	493YY	R,A	20150226	2.4			1.4	1.0
10	33JL	492BW	A,I	20150317	4.3	3.1	1.2	4.3	0.0
11	33L 3	492	A	20150310	7.2			5.7	1.5
12	33L 23	492RR	A	20150302	-7.3			-10.7	3.4
13	33N 21	492BU	A	20150218	-6.2			-9.5	3.3
14	33NQ	492BP	A,I	20150317	5.4	3.6	1.8	5.1	0.3
15	33Q 15	492AM	A	20150223	-13.8			-5.3	-8.5
16	33S 20	492BR	A	20150225	-3.5			-7.1	3.6
17	33S 43	491E	A	20150226	-8.8			-13.8	5.0
18	33ST	492BL	A	20150317	5.5	2.8	2.7	4.4	1.2
19	33T 9	492TT	A	20150318	2.0			-1.7	3.7
20	33T 13	492ZZ	A	20150323	0.1			-2.9	3.0
21	33T 15	492SS	A	20150302	1.2			-2.9	4.1
22	33T 29	491C	A	20150302	-4.6			-11.4	6.8
23	33T4	492CR	A	20150318	3.3			0.2	3.1
24	33U 11	492AJ	A	20150323	2.4			-3.7	6.1
25	33U' 3	492WW	A	20150225	9.7			5.2	4.5
26	33UV	492BH	A	20150325	6.9	4.0	2.9	5.1	1.8
27	33V' 8	492BY	R,A	20150225	1.4			1.7	-0.3
28	33W 11	502T	A	20150324	0.3			-0.5	0.8
29	33WX	502AF	A	20150325	6.3	7.6	-1.3	5.7	0.6
30	33X 10	502BD	A	20150312	1.9			0.3	1.6
31	33X 20	502J	A	20150312	-3.4			-6.5	3.1
32	33X 54	501	A,I	20150324	-6.4			-8.0	1.6
33	33XY	502BN	A	20150414	2.9	8.0	-5.1	5.6	-2.7
34	33YZ	502AD	A	20150310	8.5	7.3	1.2	6.0	2.5
35	33Z' 1	502G	A	20150312	6.8			6.5	0.3
36	33Z 11	502V	A	20140917	-8.3			-1.9	-6.4
37	34D' 6	502BH	A	20150312	5.9			5.6	0.3
38	34DG	502Z	A	20150311	5.0	5.4	-0.4	4.6	0.4

ALAMITOS BARRIER PROJECT
A-Zone
Groundwater Elevation Data for Contours and Tables

POINT	PROJ	FCD	AQUIFER	DATE	FY 14-15 ELEV	P.E. ¹	Δ ²	FY 13-14 ELEV	CHANGE IN ELEV
39	34F 5	502BR	A	20150312	2.3			1.4	0.9
40	34F 10	502AR	A	20150323	-0.7			-1.5	0.8
41	34F'13	503Q	A	20150312	4.8			7.2	-2.4
42	34H 25	502AH	A	20150407	-7.6			-9.1	1.5
43	34H5	512E	A	20150402	-7.3			-14.4	7.1
44	34HJ	502BX	A	20150311	4.3	8.6	-4.3	4.3	0.0
45	34JL	503AP	A	20150311	3.7	7.8	-4.1	4.2	-0.5
46	34L 10	502AM	A	20150312	1.8			4.6	-2.8
47	34LS	503BD	A	20150311	2.3	7.6	-5.3	7.7	-5.4
48	34N 21	512B	A	20150303	-2.7			-7.4	4.7
49	34N' 7	503AF	A	20150312	0.9			5.4	-4.5
50	34U 8	513F	A	20150312	1.1			4.6	-3.5
51	34V 20	513B	A	20150326	-6.3			-7.0	0.7
52	34VZ	503BH	A	20150311	-0.7	4.4	-5.1	2.9	-3.6
53	34W' 5	503AJ	A	20140925	-0.8			2.3	-3.1
54	34X40	513P	A	20150406	-11.8			-15.0	3.2
55	35E0.1	503BK	A	20150311	-0.5	2.1	-2.6	0.7	-1.2
56	35F 20	513J	A	20150326	-4.8			-2.8	-2.0
57	35H 11	514G	A	20150330	-4.3	3.8	-8.1	0.0	-4.3
58	35H 12	514D	A	20150330	-5.2	3.8	-9.0	-3.1	-2.1
59	35J1	514L	A	20150311	-3.8			-3.6	-0.2
60	35K1	523B	A	20150311	-5.0			-5.5	0.5
61	36F' 1	505D	A	20150310	6.7			-0.5	7.2
62	OCWD- BSO9A/3		A	20150305	-6.8			-8.7	1.9
63	OCWD- BS14/3		A	20150409	-7.2				n/a
64	OCWD- BS21/3		A	20150409	-6.6				n/a

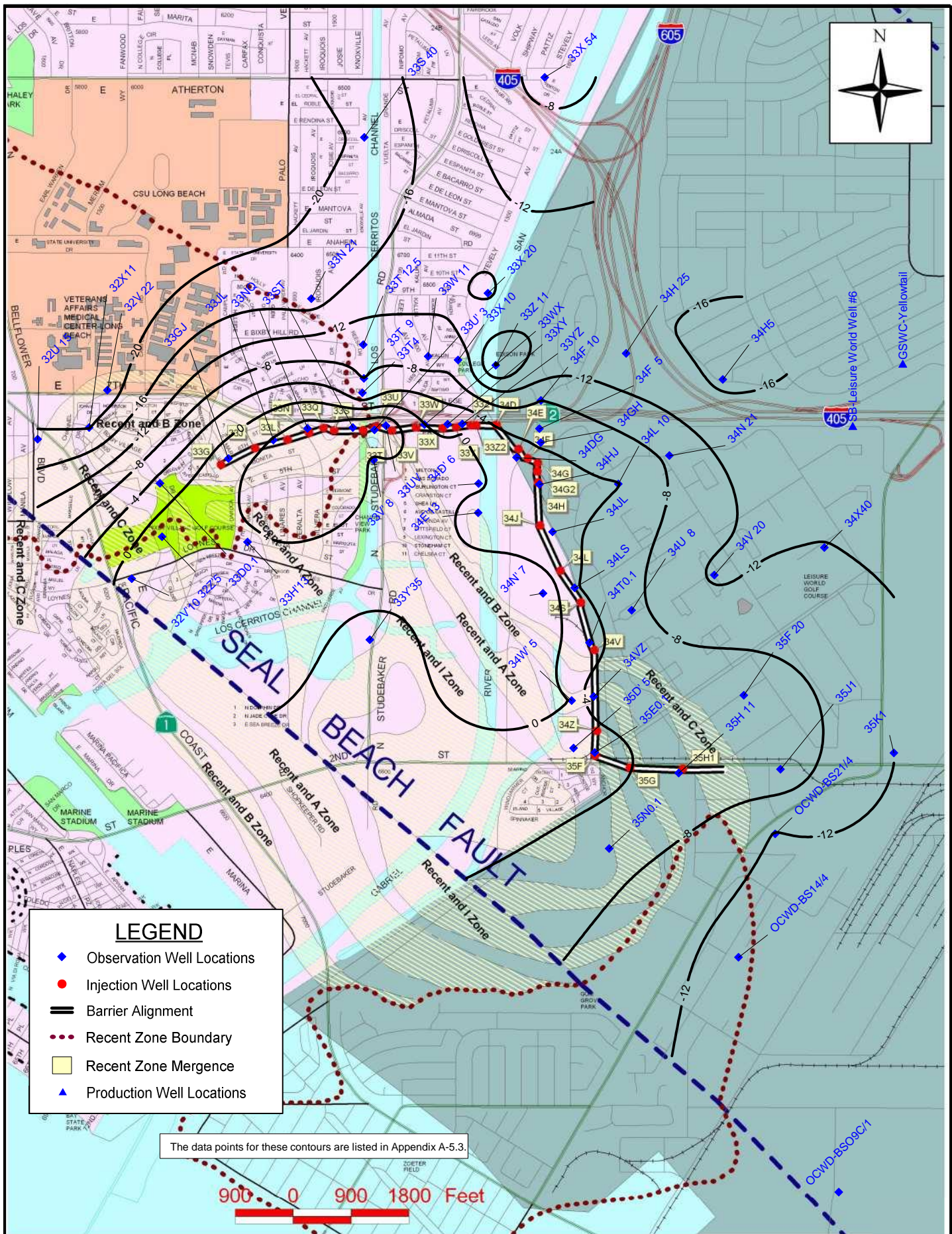
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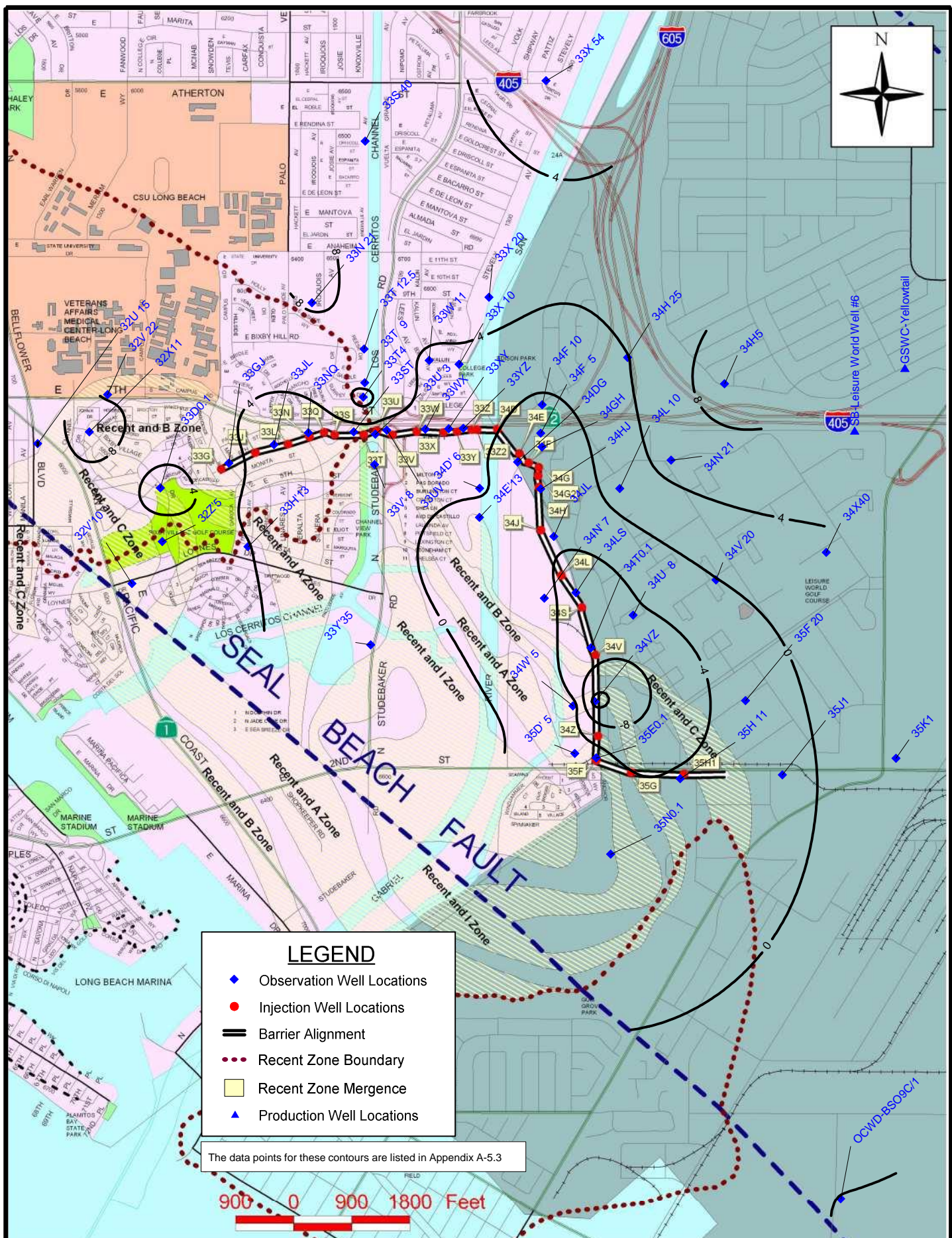
AVG= -1.4

¹ P.E. represents the protective elevations calculated for internodal wells.

² Δ (+/-) represents how much groundwater level is above/below respective P.E.

 = A max. or min. elevation during that period.





ALAMITOS BARRIER PROJECT
I-Zone
Groundwater Elevation Data for Contours and Tables

POINT	PROJ	FCD	AQUIFER	DATE	FY 14-15 ELEV	P.E. ¹	Δ^2	FY 13-14 ELEV	CHANGE IN ELEV
1	32U 15	482L	I	20150218	-19.1			-23.0	3.9
2	32V 22	482N	I	20150219	-21.9			-29.5	7.6
3	32V'10	483E	I	20150219	1.7			-5.3	7.0
4	32X11	482R	I	20150316	-20.1			-31.5	11.4
5	32Z'5	482V	I	20150223	2.1			-3.7	5.8
6	33D0.1	482U	A,I	20150413	-2.7			-4.7	2.0
7	33GJ	482Y	I	20150317	2.5	2.6	-0.1	-3.4	5.9
8	33H'13	493XX	I	20150226	3.5			-0.6	4.1
9	33JL	492BW	A,I	20150317	4.3	3.1	2.5	4.3	0.0
10	33N 21	492BV	I	20150215	-17.7			-25.9	8.2
11	33NQ	492BP	A,I	20150331	5.6	3.6	2.0	5.1	0.5
12	33S 40	491F	I	20150224	-19.6			-27.2	7.6
13	33ST	492BM	I	20150331	6.6	4.2	2.4	4.3	2.3
14	33T 9	492XX	I	20150319	-8.0			-14.3	6.3
15	33T 12.5	492BT	I	20150226	-8.6			-16.1	7.5
16	33T4	492CQ	I	20150312	-7.4			-17.7	10.3
17	33U' 3	492QQ	I	20150225	7.3			4.9	2.4
18	33UV	492BJ	I	20150325	6.7	6.1	0.6	4.5	2.2
19	33V' 8	492BX	I	20150225	3.4			1.2	2.2
20	33W 11	502U	I	20150324	-10.3			-13.4	3.1
21	33WX	502AG	I	20150331	0.1	10.4	-10.3	-3.0	3.1
22	33X 10	502BE	I	20150312	-8.9			-12.5	3.6
23	33X 20	502H	I	20150312	-11.5			-16.9	5.4
24	33X 54	501	A,I	20150324	-6.4			-8.0	1.6
25	33XY	502BP	I	20150402	-2.0	11.0	-13.0	-3.6	1.7
26	33Y'35	493ZZ	I	20150303	-1.5			-3.5	2.0
27	33YZ	502AE	I	20150310	0.0	11.1	-11.1	-3.3	3.3
28	33Z 11	502W	I	20140917	-20.4				n/a
29	34D' 6	502BI	I	20150304	0.6			-0.7	1.3
30	34DG	502AA	I	20150311	-2.8	6.5	-9.3	1.1	-3.9
31	34E'13	503AT	I	20150312	-1.8			1.2	-3.0
32	34F 5	502BQ	I	20150312	-4.7			-2.7	-2.0
33	34F 10	502AS	I	20150323	-8.0			-7.1	-0.9
34	34GH	502BV	I	20150311	-4.4	10.5	-14.9	-1.0	-3.4
35	34H 25	502AJ	I	20150407	-15.4			-19.3	3.9
36	34H5	512D	I	20150402	-16.8			-26.9	10.1
37	34HJ	502BW	I	20150311	-1.9	11.0	-12.9	1.9	-3.8
38	34JL	503AN	I	20150331	-3.2	10.5	-13.7	0.4	-3.6

ALAMITOS BARRIER PROJECT
I-Zone
Groundwater Elevation Data for Contours and Tables

POINT	PROJ	FCD	AQUIFER	DATE	FY 14-15 ELEV	P.E. ¹	Δ ²	FY 13-14 ELEV	CHANGE IN ELEV
39	34L 10	502AN	I	20150311	-3.9			-5.9	2.0
40	34LS	503BC	I	20150311	-3.7	9.9	-13.6	3.5	-7.2
41	34N 21	512C	I	20150303	-8.6			-13.7	5.1
42	34N' 7	503AG	I	20150312	3.1			5.1	-2.0
43	34T0.1	503AD	I	20150331	-2.1	8.4	-10.5	4.0	-6.1
44	34U 8	513G	I	20150312	-7.2			-2.6	-4.6
45	34V 20	513C	I	20150326	-12.6			-12.5	-0.1
46	34VZ	503BG	I	20150330	-6.8	6.7	-13.5	6.9	-13.7
47	34W' 5	503AK	I	20150310	-0.1			2.1	-2.2
48	34X40	513N	I	20150422	-11.8			-14.8	3.0
49	35D' 5	503AM	I	20140925	-2.1			0.0	-2.1
50	35E0.1	503BJ	I	20150401	-1.6	3.1	-4.7	0.6	-2.2
51	35F 20	513H	I	20150326	-5.0			-2.9	-2.1
52	35H 11	514H	I	20150330	-5.2	5.5	-10.7	-1.7	-3.5
53	35J1	513M	I	20150311	-5.4			-4.0	-1.4
54	35K1	523C	I	20150311	-12.0			-15.1	3.1
55	35N0.1	504N	I	20141008	-6.5			-2.7	-3.8
56	OCWD- BSO9C/1		I	20150305	-14.4			-18.5	4.1
57	OCWD- BS14/4		I	20150409	-13.5				n/a
58	OCWD- BS21/4		I	20150409	-12.2				n/a

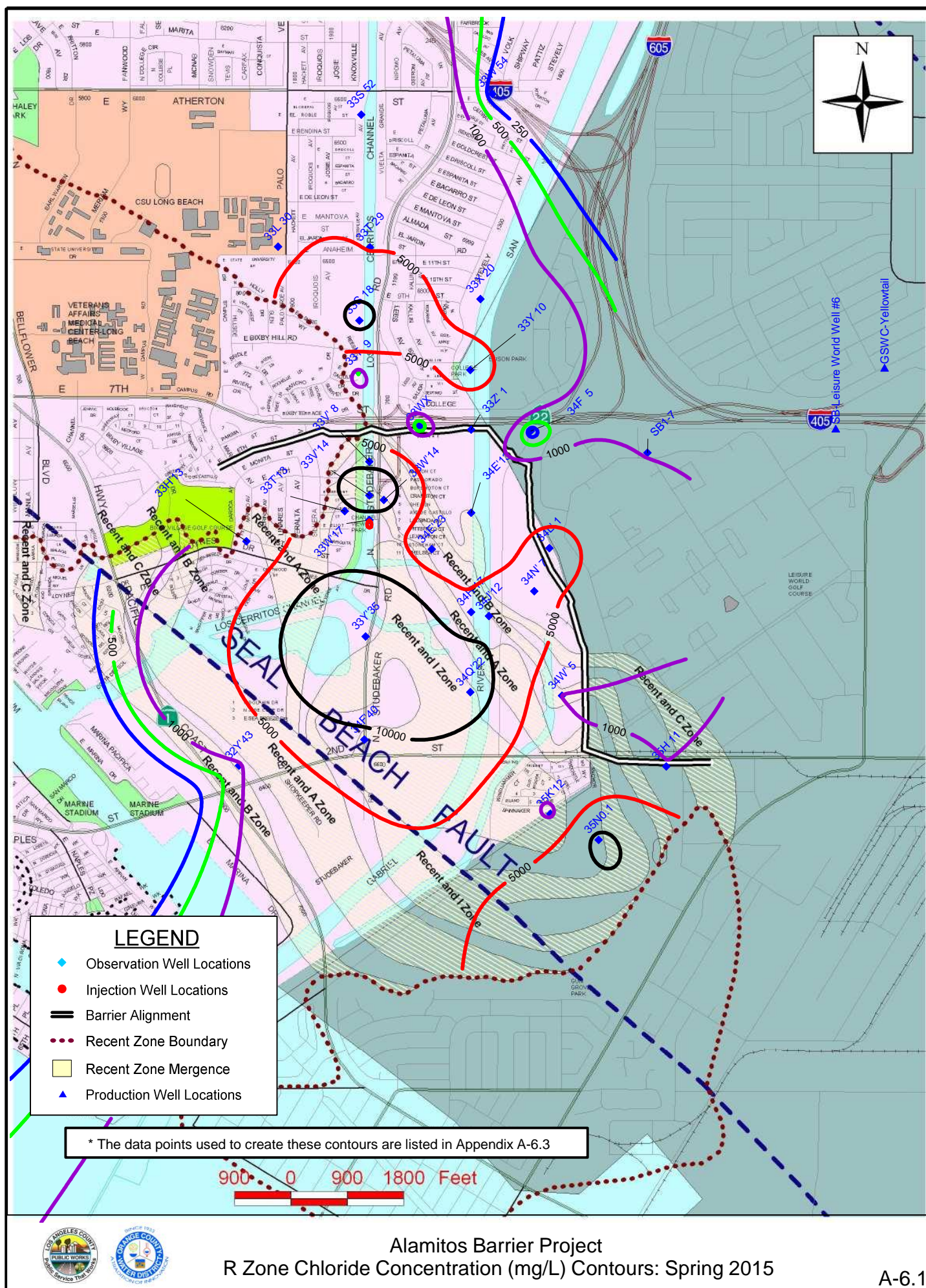
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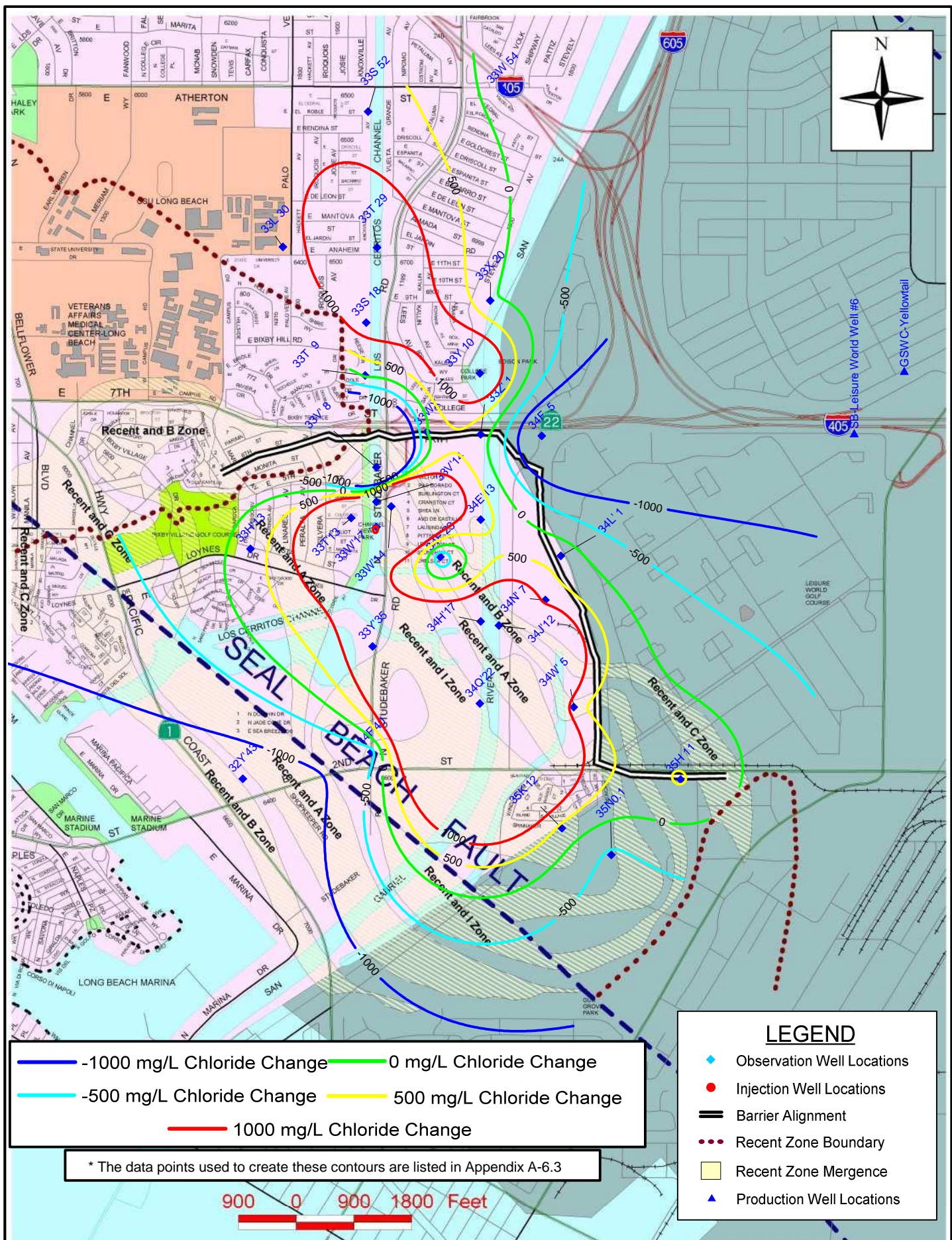
AVG= -6.7

¹ P.E. represents the protective elevations calculated for internodal wells.

² Δ (+/-) represents how much groundwater level is above/below respective P.E.

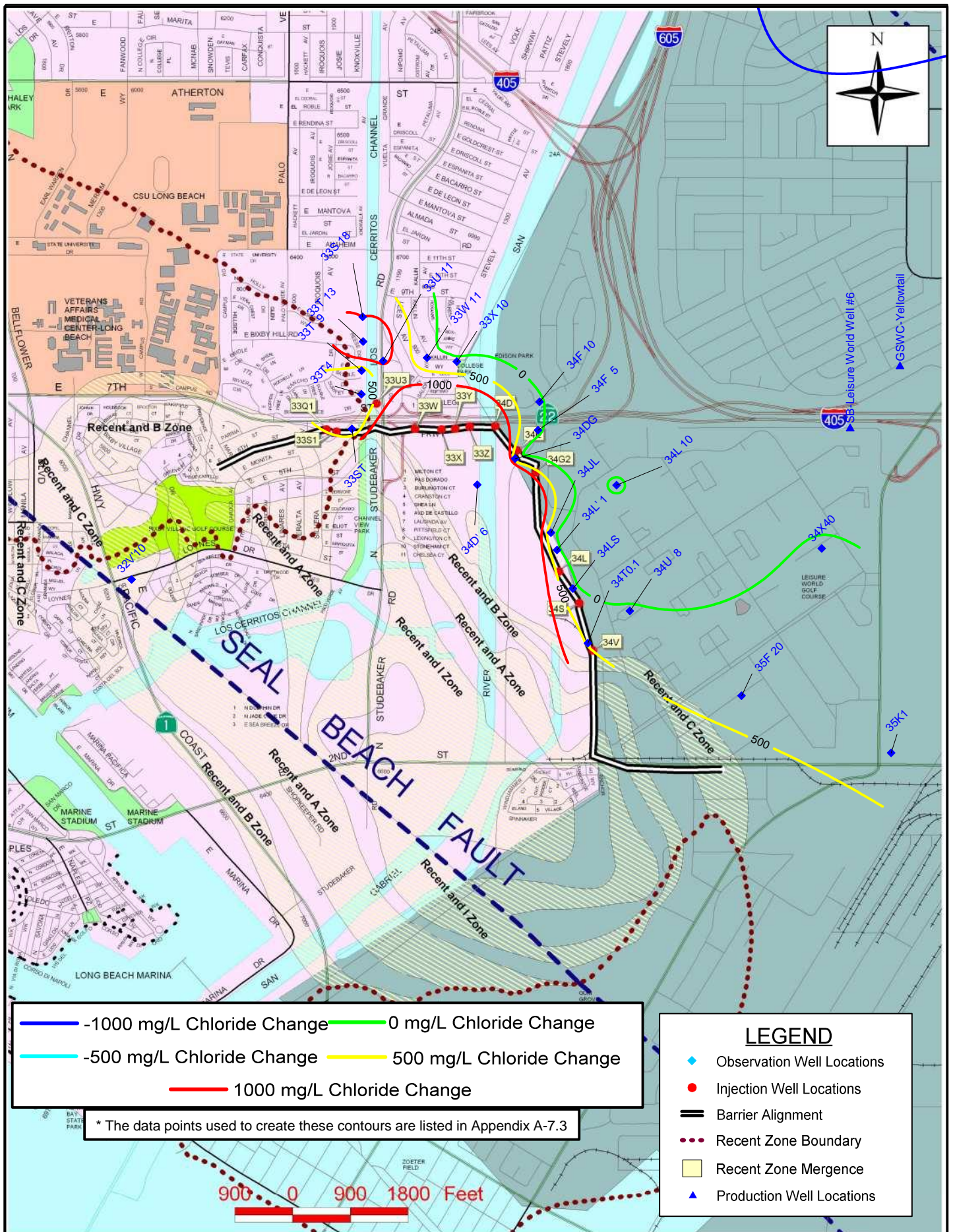
= A max. or min. elevation during that period.





ALAMITOS BARRIER PROJECT
R-ZONE CHLORIDE CONCENTRATIONS
Chloride Data Used for Contours and Cross-Section

No.	PROJ	FCD	DATE	AQUIFER	For Cross-Section (Internodal Wells in Bold)						For Contours	MAX CHLORIDE	Change in Chloride
					ELEV 1 (ft)	CHL 1 (mg/L)	ELEV 2 (ft)	CHL 2 (mg/L)	ELEV 3 (ft)	CHL 3 (mg/L)	MAX CHL. 14-15	13-14	(FY14-15 - FY13-14)
1	32Y'43	493WW	20150312	R	-43	781					781	2,060	-1,279
2	33H'13	493YY	20150226	(R,A)	-18	270	-38	840	-58	1,200	1,200	972	228
3	33L 30	491G	20150224	R	-50	4,000					4,000	3,180	820
4	33S 18	492AH	20150226	R	-67	12,000					12,000	10,700	1,300
5	33S 52	491J	20150223	R	-54	3,800					3,800	2,990	810
6	33T 9	492CV	20150319	R	-21	409					409	338	71
7	33T 29	491D	20150302	R	-56	4,700					4,700	3,210	1,490
8	33T'13	492AU	20150226	R	-41	3,500	-51	7,600			7,600	4,020	3,580
9	33V' 8	492BY	20150225	(R,A)	-24	3,700	-48	7,500			7,500	13,800	-6,300
10	33V'14	492JJ	20150225	R	-67	21,000					21,000	18,100	2,900
11	33W 54	501C	20150224	R	-33	100	-53	100			100	299	-199
12	33W'14	492AT	20150225	R	-46	7,500	-66	13,000			13,000	5,300	7,700
13	33W'17	493PP	20150224	R	-41	4,800	-51	4,300			4,800	4,090	710
14	33WX	502AZ	20150315	R	-45	62					66	72	-6
15	33X 20	502L	20150315	R	-68	1,710					1,900	1,860	40
16	33Y 10	502BA	20150224	R	-58	970	-83	7,400			7,400	5,350	2,050
17	33Y'35	493AB	20150303	R	-36	24,000					24,000	22,400	1,600
18	33Z' 1	502AU	20150406	R	-46	1,800	-56	1,690			1,800	1,600	200
19	34E'13	503AU	20150303	R	-19	390	-52	1,200			1,200	432	768
20	34E'23	503X	20150312	R	-43	2,250					2,250	3,150	-900
21	34F 5	502BT	20150401	R	-136	72	-146	80	-156	81	81	2,170	-2,089
22	34F'40	483J	20150311	R	-40	8,190					8,190	8,860	-670
23	34H'17	503Y	20150304	R	-46	5,100					5,100	3,030	2,070
24	34J'12	503U	20150303	R	-28	10,000	-36	9,100			10,000	6,070	3,930
25	34L' 1	503P	20150401	R	-57	6,820					6,820	6,480	340
26	34N' 7	503AE	20150305	R	-51	210	-61	4,200	-70	5,400	5,400	4,560	840
27	34Q'22	503T	20150304	R	-42	8,800	-57	13,000			13,000	4,200	8,800
28	34W' 5	503AH	20150310	R	-51	938					938	306	632
29	35H 11	514F	20150409	R	-42	229	-65	1,090			1,090	529	561
30	35K'12	504R	20150311	R	-44	323	-54	457			457	86	371
31	35N0.1	504M	20150309	R	-38	9,820	-62	11,400			11,400	12,000	-600
32	SB1-7		20150511	R		900					457	86	371

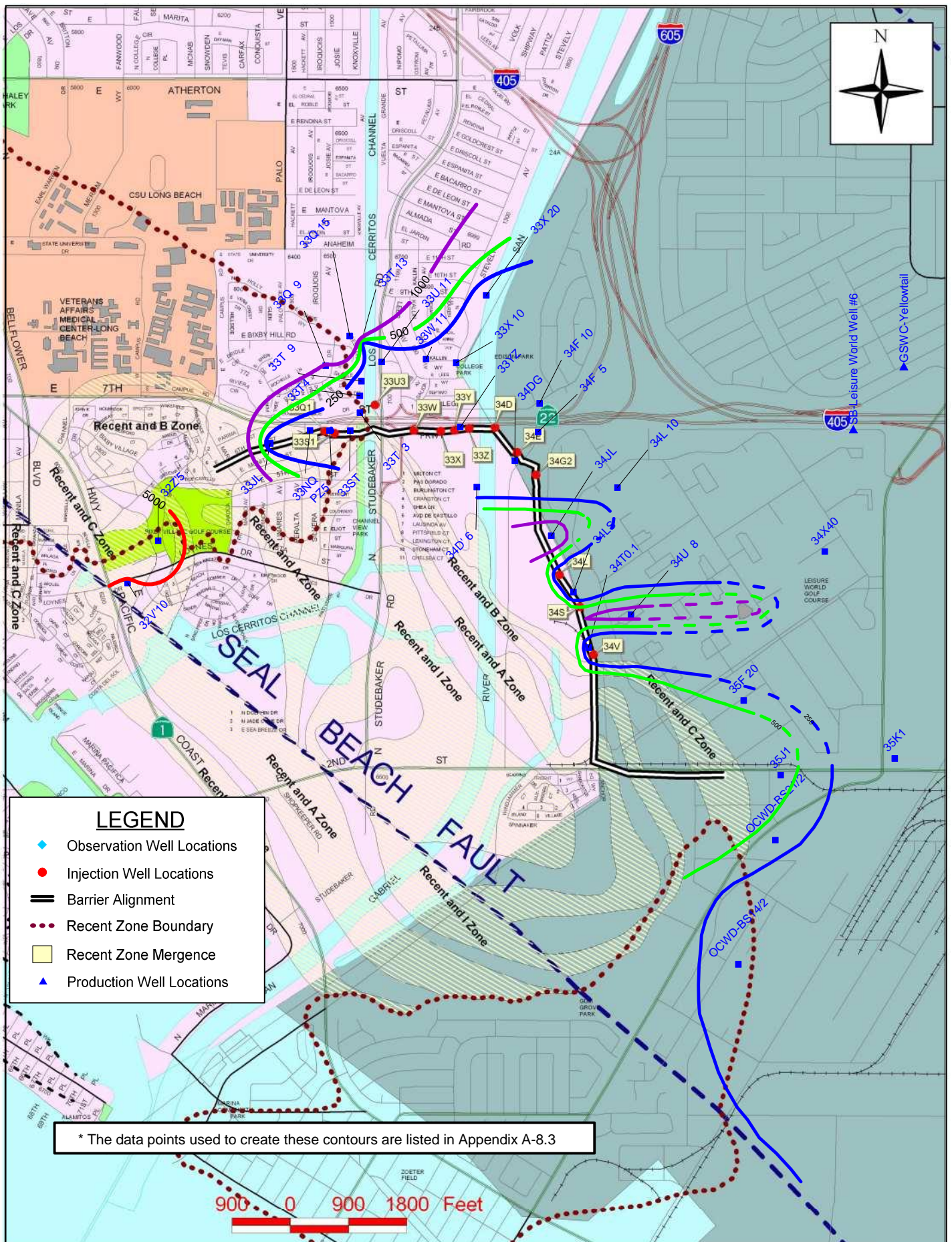


Alamitos Barrier Project
C Zone: Change in Chloride Concentration, Spring 2014 to Spring 2015

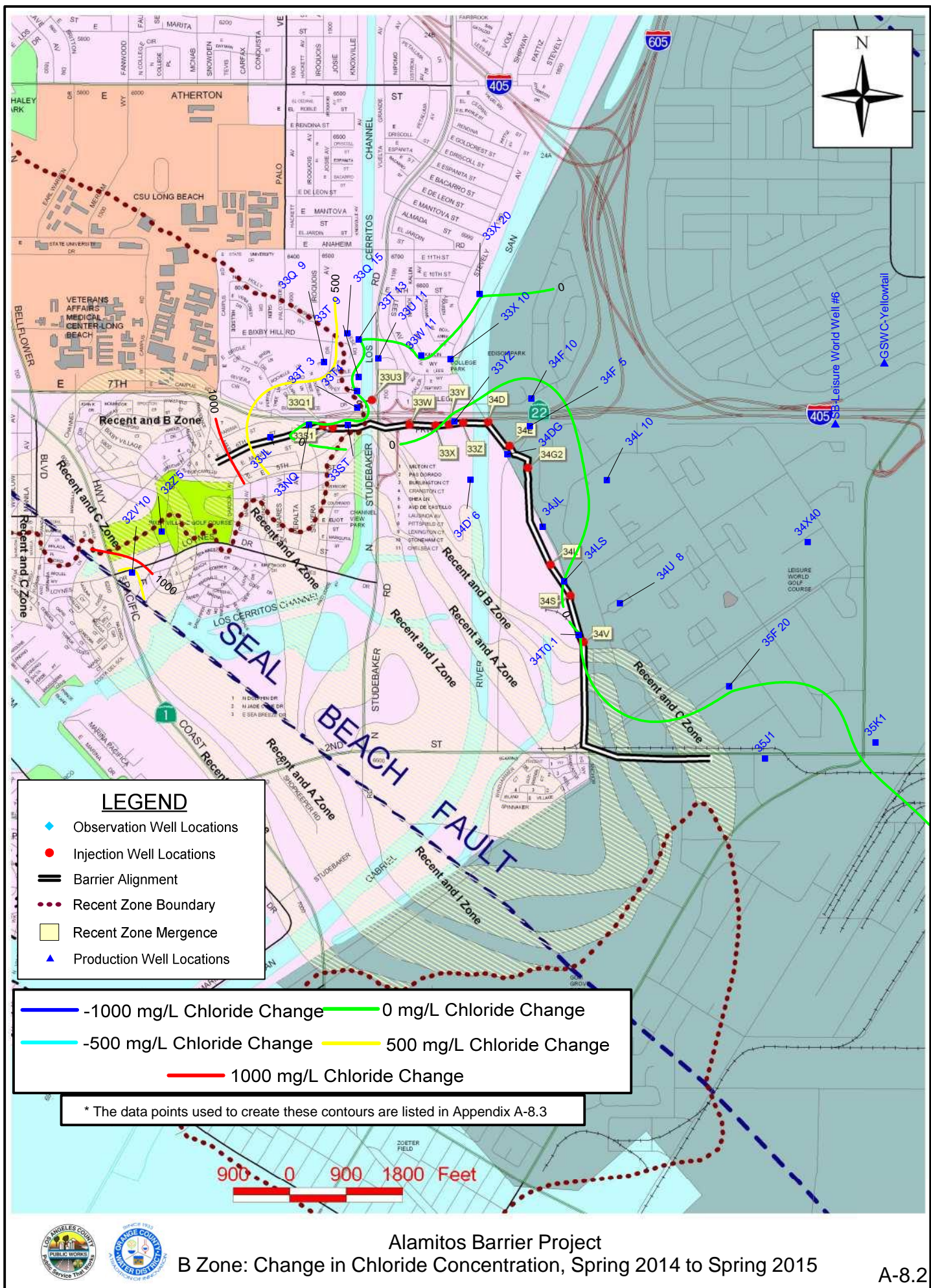
ALAMITOS BARRIER PROJECT
C-ZONE CHLORIDE CONCENTRATIONS
Chloride Data Used for Contours and Cross-Section

No.	PROJ	FCD	DATE	AQUIFER	For Cross-Section (Internodal Wells in Bold)						For Contours	MAX CHLORIDE	Change in Chloride
					ELEV 1 (ft)	CHL 1 (mg/L)	ELEV 2 (ft)	CHL 2 (mg/L)	ELEV 3 (ft)	CHL 3 (mg/L)	MAX CHL. 14-15	13-14	(FY14-15 - FY13-14)
1	32V10	483H	20150219	C	-37	2,700					2,700	2,370	330
2	33S 18	492AG	20150226	C	-225	1,000					1,000	474	526
3	33ST	492BK	20150317	C,B	-25	81					81	108	-27
4	33T 13	492AC	20150323	C	-199	1,980					1,980	894	1,086
5	33T4	492CT	20150318	C	-56	74					74	96	-22
6	33T 9	492CU	20150319	C	-129	168	-144	272			272	460	-188
7	33U 11	492AL	20150323	C	-188	1,100					1,100	624	476
8	33W 11	502R	20150324	C	-183	71	-216	92			92	87	5
9	33X 10	502BB	20150302	C	-190	66	-215	74			74	82	-8
10	34D 6	502BF	20150304	C	-125	11,000					11,000	11,400	-400
11	34DG	502X	20150331	C	-190	73	-205	99			99	64	35
12	34F 5	502BU	20150401	C	-191	84	-201	88	-211	71	88	63	25
13	34F 10	502AP	20150323	C	-211	75					75	70	5
14	34JL	503AR	20150331	C	-161	149					149	200	-51
15	34L' 1	503N	20150401	C	-162	103					103	75	28
16	34L 10	502AK	20150304	C	-166	85					85	72	13
17	34LS	503BF	20150331	C	-133	87	-151	70	-163	68	87	81	6
18	34T0.1	503AB	20150331	C	-134	461					461	447	14
19	34U 8	513D	20150326	C	-150	68	-165	68			68	80	-12
20	34X40	513R	20150406	C	-85	39	-101	65			65	115	-50
21	35F 20	513L	20150326	C	-70	292	-78	260	-85	356	356	415	-59
22	35K1	523D	20150406	C	-88	357	-98	366			366	392	-26
23	OCWD-BS14/2		20150409	C		195					195	n/a	n/a
24	OCWD-BS21/2		20150409	C		189					189	n/a	n/a
25	SB1 6		20150511			82					82	n/a	n/a
25	33Q1					DP1					50	50	n/a
25	33U3					DP2					50	50	n/a
26	33W					DP3					50	50	n/a
27	33X					DP4					50	50	n/a
28	33Y					DP5					50	50	n/a
29	33Z					DP6					50	50	n/a
30	34D					DP7					50	50	n/a
31	34E					DP8					50	50	n/a
32	34G2					DP9					50	50	n/a
33	34L					DP10					50	50	n/a
34	34S					DP11					50	50	n/a
35	34V					DP12					50	50	n/a

DP = Dummy Point with an assumed chloride concentration of 50 mg/L. Placed at wells that were injecting into this zone during this reporting period.



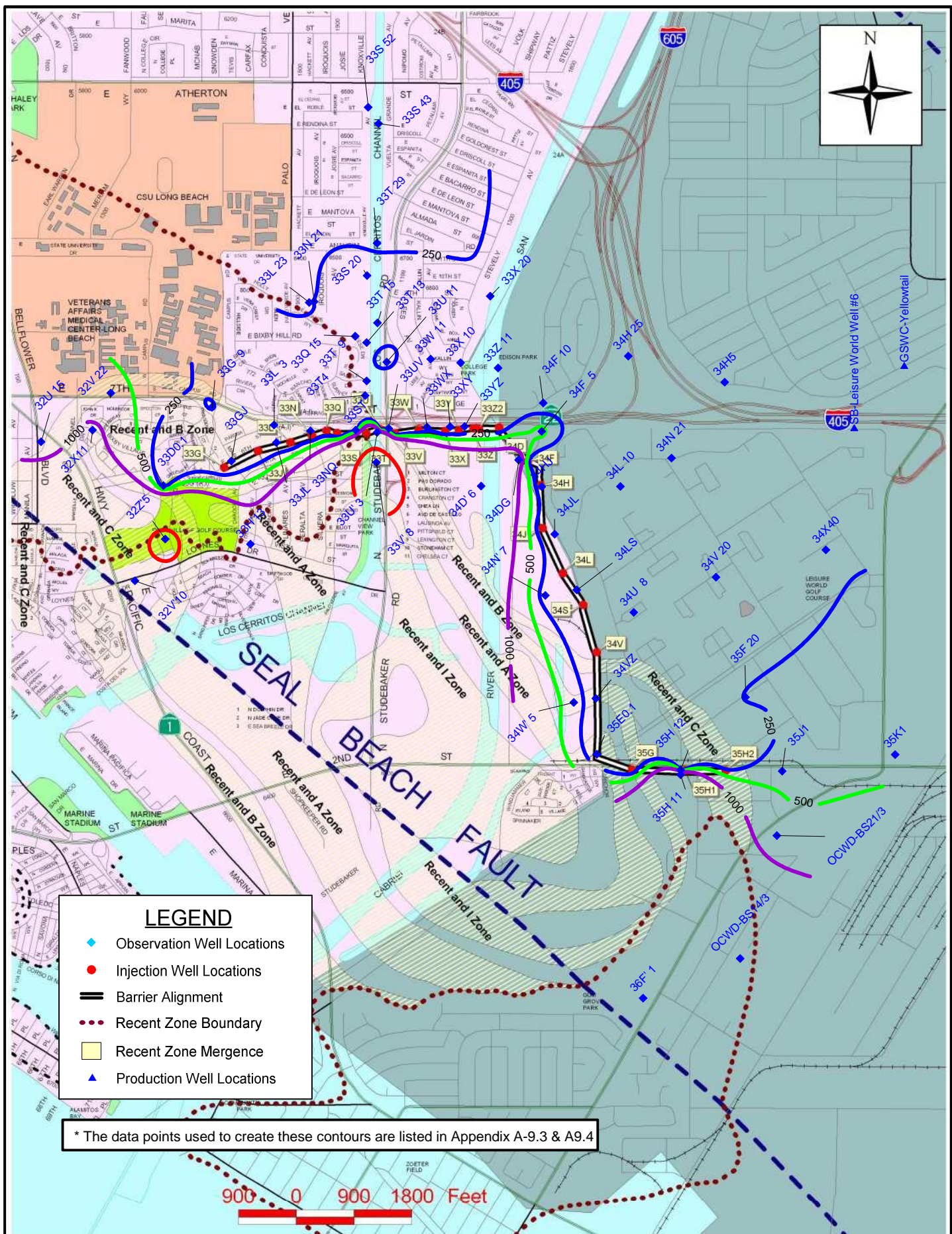
Alamitos Barrier Project
B Zone Chloride Concentration (mg/L) Contours: Spring 2015

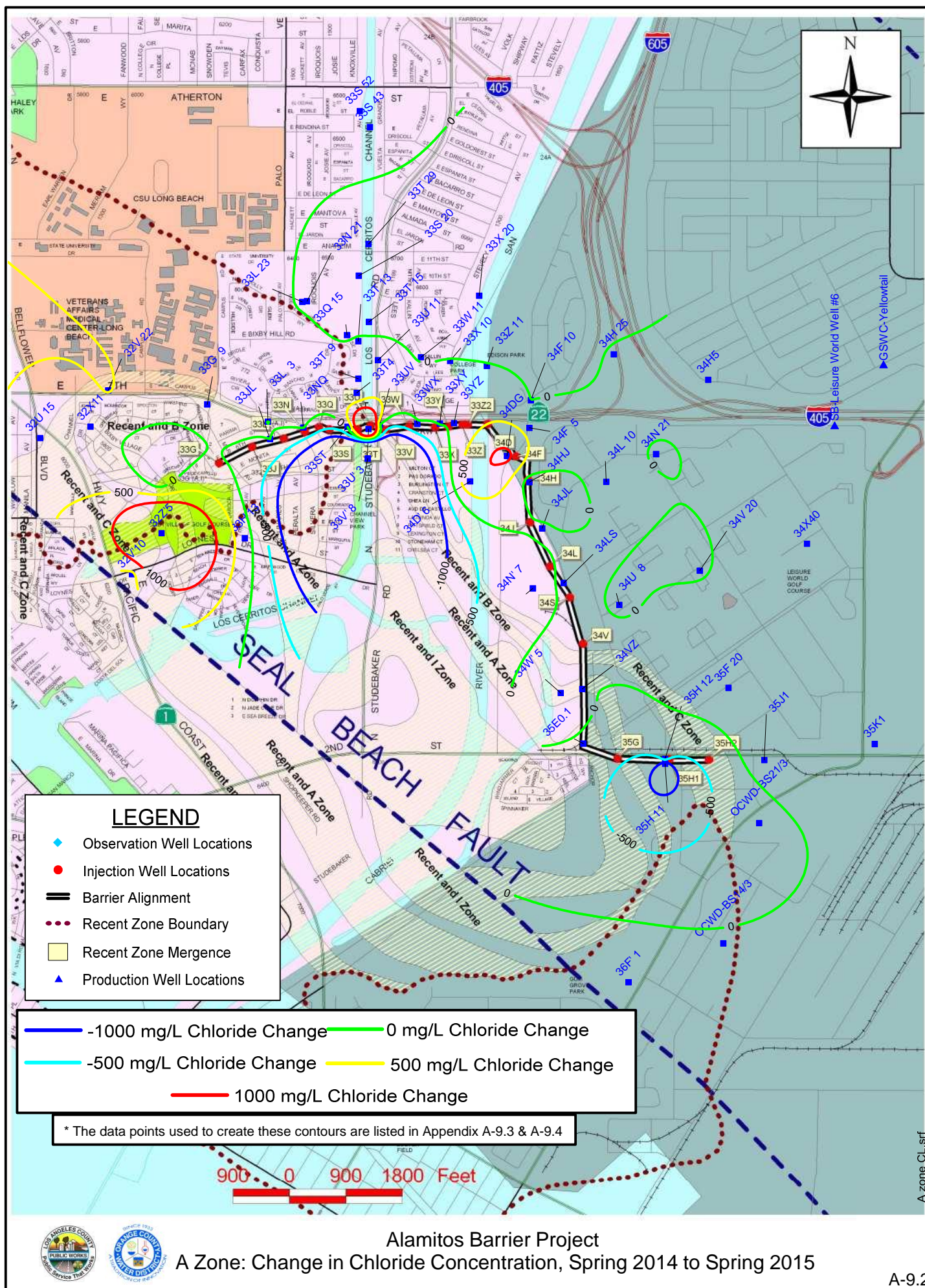


ALAMITOS BARRIER PROJECT
B-ZONE CHLORIDE CONCENTRATIONS
Chloride Data Used for Contours and Cross-Section

No.	PROJ	FCD	DATE	AQUIFER	For Cross-Section (Internodal Wells in Bold)						For Contours	MAX CHLORIDE	Change in Chloride
					ELEV 1 (ft)	CHL 1 (mg/L)	ELEV 2 (ft)	CHL 2 (mg/L)	ELEV 3 (ft)	CHL 3 (mg/L)	MAX CHL. 14-15	13-14	(FY14-15 - FY13-14)
1	32V10	483G	20150219	B	-62	4,900					4,900	4,580	320
2	32Z5	482W	20150223	B,A	-20	1,000	-30	4,500	-40	6,100	6,100	3,010	3,090
3	33JL	492BQ	20150317	B	3		-7	63			63	62	1
4	33NQ	492BN	20150317	B	-3	86	-14	80			86	108	-22
5	33Q 9	492CM	20150218	B	-85	66	-95	69	-105	920	920	133	787
6	33Q 15	492AN	20150223	B	-263	3,600					3,600	3,230	370
7	33ST	492BK	20150317	C,B	-25	81					81	108	-27
8	33T 3	492CL	20150224	B	-40	98	-57	110	-75	170	170	107	63
9	33T 4	492CS	20150318	B	-91	92					92	101	-9
10	33T 9	492YY	20150319	B	-163	101					101	233	-132
11	33T 13	492AB	20150323	B	-254	189					189	187	2
12	33U 11	492AK	20150323	B	-260	146					146	161	-15
13	33W 11	502S	20150315	B	-241	127	-269	139			139	151	-12
14	33X 10	502BC	20150324	B	-275	63					63	74	-11
15	33X 20	502K	20150325	B	-266	71					71	69	2
16	33YZ	502AC	20140915	B	-214	74	-263	75			75	67	8
17	34D 6	502BG	20150304	B	-180	73	-194	150			150	75	75
18	34DG	502Y	20150331	B	-232	83	-257	88			88	57	31
19	34F 5	502BS	20150402	B	-231	92	-260	100			100	55	45
20	34F 10	502AQ	20150323	B	-269	69					69	64	5
21	34JL	503AQ	20150331	B	-196	1,300	-211				1,300	1,040	260
22	34L 10	502AL	20150311	B	-224	65	-249	66			66	130	-64
23	34LS	503BE	20150331	B	-188	76					76	78	-2
24	34T0.1	503AC	20150331	B	-174	71	-207	71	-239	77	77	66	11
25	34U 8	513E	20150326	B	-225	1,620					1,620	2,050	-430
26	34X40	513Q	20150406	B	-137	67					67	101	-34
27	35F 20	513K	20150326	B	-115	347					347	357	-10
28	35J1	514M	20150409	B	-128	653	-143	653	-148	997	997	871	126
29	35K1	523A	20150406	B	-127	122	-142	125	-157	129	129	157	-28
30	OCWD-BS14/2		20150324	B		34					34	n/a	n/a
31	OCWD-BS21/2		20150203	B		355					355	n/a	n/a
32	33Q1					DP1					50	50	n/a
33	33U3					DP2					50	50	n/a
34	33W					DP3					50	50	n/a
35	33X					DP4					50	50	n/a
36	33Y					DP5					50	50	n/a
37	33Z					DP6					50	50	n/a
38	34D					DP7					50	50	n/a
39	34E					DP8					50	50	n/a
40	34G2					DP9					50	50	n/a
41	34L					DP10					50	50	n/a
42	34S					DP11					50	50	n/a
43	34V					DP12					50	50	n/a

DP = Dummy Point with an assumed chloride concentration of 50 mg/L. Placed at wells that were injecting into this zone during this reporting period.





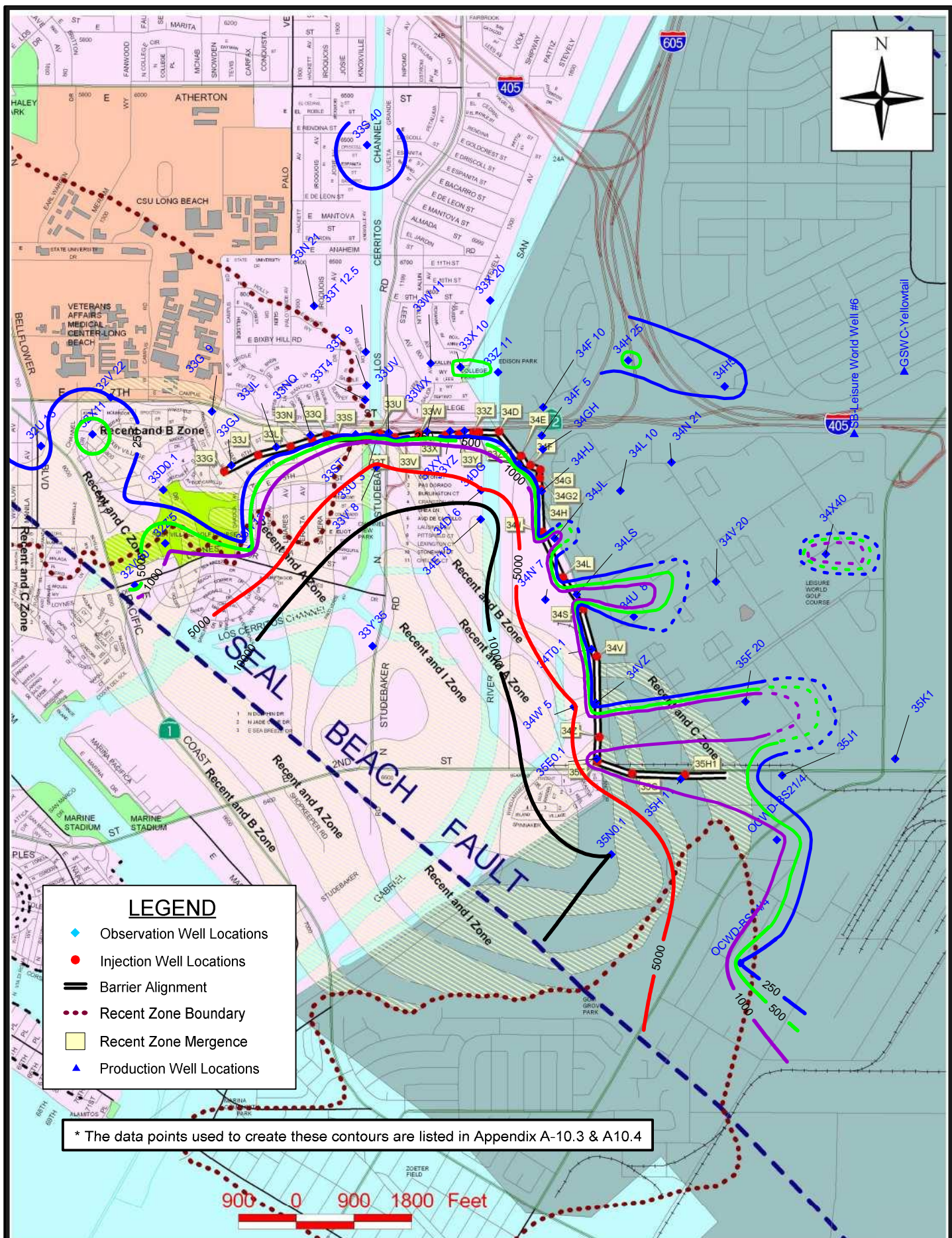
ALAMITOS BARRIER PROJECT
A-ZONE CHLORIDE CONCENTRATIONS
Chloride Data Used for Contours and Cross-Section

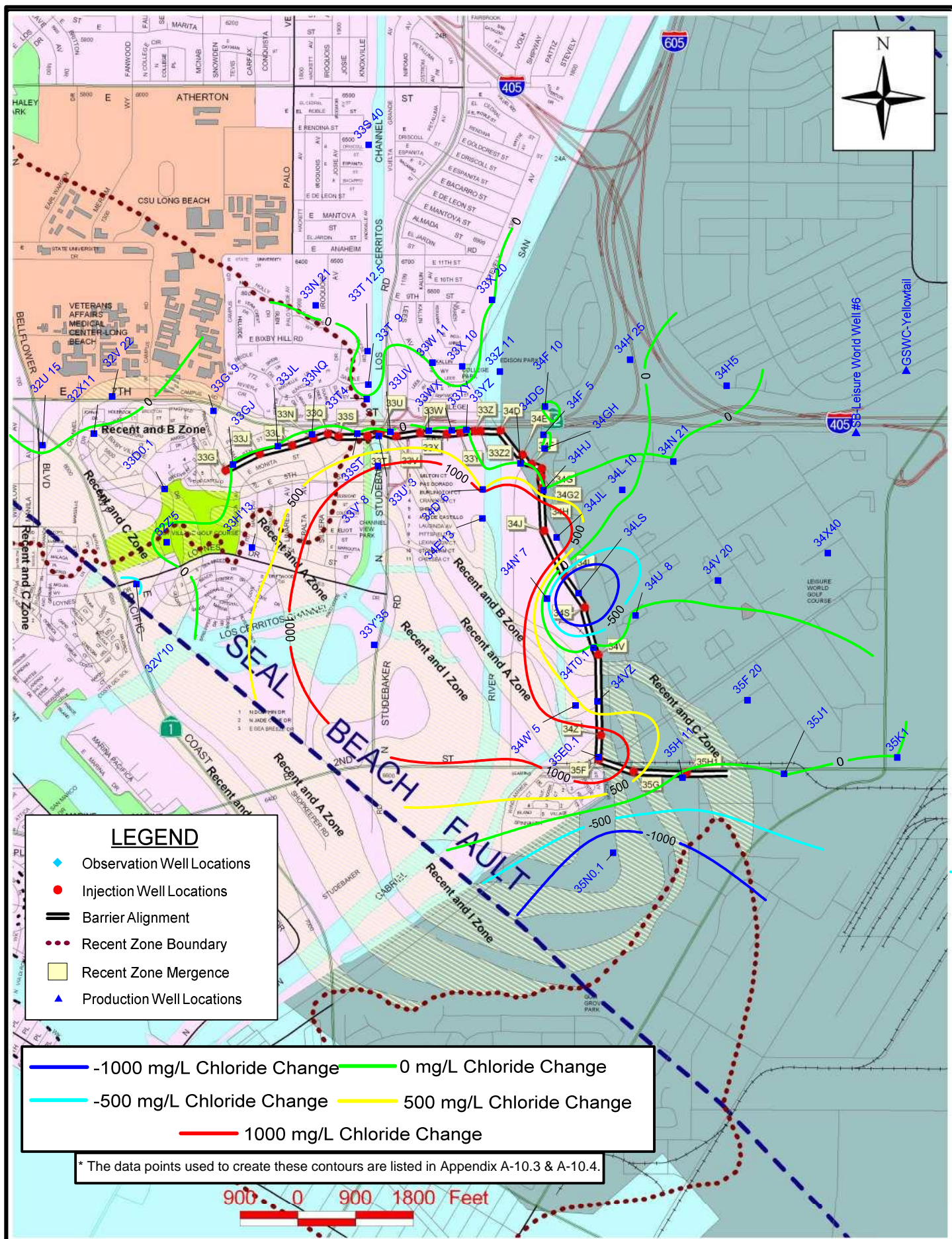
No.	PROJ	FCD	DATE	AQUIFER	For Cross-Section (Internodal Wells in Bold)						For Contours	MAX CHLORIDE	Change in Chloride
					ELEV 1 (ft)	CHL 1 (mg/L)	ELEV 2 (ft)	CHL 2 (mg/L)	ELEV 3 (ft)	CHL 3 (mg/L)	MAX CHL. 14-15	13-14	(FY14-15 - FY13-14)
1	32U 15	482M	20150218	A	-17	700					700	249	451
2	32V 22	482P	20150219	A	-11	660					660	130	530
3	32V'10	483F	20150219	A	-90	3,500	-105	3,500			3,500	3,110	390
4	32X11	482S	20150316	A	-9	216	-24	1,120			1,120	1,070	50
5	32Z'5	482W	20150223	B,A	-20	1,000	-30	4,500	-40	6,100	6,100	3,010	3,090
6	33D0.1	482U	20150316	A,I	-24	91	-49	110	-74	91	110	482	-372
7	33G 9	482F	20150224	A	-3		-23	270			270	111	159
8	33GJ	482X	20150317	A	-35	50					50	62	-12
9	33H'13	493YY	20150226	R,A	-18	270	-38	840	-58	1,200	1,200	972	228
10	33JL	492BW	20150317	A,I	-41	71	-79	87	-116	77	87	85	2
11	33L 3	492	20150310	A	-60	50					50	56	-6
12	33L 23	492RR	20150302	A	-344	360					360	390	-30
13	33N 21	492BU	20150218	A	-305	200	-330	210	-346	230	230	248	-18
14	33NQ	492BP	20150317	A,I	-48	86	-92	94	-136	93	94	72	23
15	33Q 15	492AM	20150223	A	-337	93					93	126	-33
16	33S 20	492BR	20150225	A	-317	96	-336	96	-355	97	97	268	-171
17	33S 43	491E	20150226	A	-333	370	-344	370			370	223	147
18	33S 52	491H	20150223	A	-284	250	-289	260			260	239	21
19	33ST	492BL	20150317	A	-65	85	-86	89	-100	85	89	97	-8
20	33T4	492CR	20150318	A	-146	139	-166	119	-186	74	139	124	15
21	33T 9	492TT	20150318	A	-262	148					148	89	59
22	33T 13	492ZZ	20150323	A	-128	130					130	96	34
23	33T 15	492SS	20150302	A	-334	120					120	211	-91
24	33T 29	491C	20150302	A	-350	300					300	467	-167
25	33U 11	492AJ	20150323	A	-348	368					368	202	166
26	33U' 3	492WW	20150225	A	-89	3,700					3,700	163	3,537
27	33UV	492BH	20150325	A	-106	83	-131	83	-155	82	83	94	-11
28	33V 8	492BY	20150225	R,A	-24	3,700	-48	7,500			7,500	13,800	-6,300
29	33W 11	502T	20150324	A	-321	81	-349	80	-376	79	81	119	-38
30	33WX	502AF	20150325	A	-258	84	-281	103	-297	114	114	170	-56
31	33X 10	502BD	20150302	A	-320	92	-340	91	-356	91	92	81	11
32	33X 20	502J	20150324	A	-353	248					248	512	-264
33	33XY	502BN	20150406	A	-279	91	-296	92	-311	92	92	78	13
34	33YZ	502AD	20150402	A	-296	93	-327	93			93	75	18
35	33Z 11	502V	20140917	A	-321	80	-346	80			80	66	14
36	34D' 6	502BH	20150304	A	-270	2,000	-303	2,600	-335	2,000	2,600	1,620	980
37	34DG	502Z	20150331	A	-292	79	-324	1,440			1,440	289	1,151
38	34F 5	502BR	20150401	A	-297	588	-322	470	-347	386	588	225	363
39	34F 10	502AR	20150323	A	-311	81	-326	77			81	82	-1
40	34H 5	512E	20150402	A	-298	92	-313	118	-328	92	118	88	30

ALAMITOS BARRIER PROJECT
A-ZONE CHLORIDE CONCENTRATIONS
Chloride Data Used for Contours and Cross-Section

No.	PROJ	FCD	DATE	AQUIFER	For Cross-Section (Internodal Wells in Bold)						For Contours	MAX CHLORIDE	Change in Chloride
					ELEV 1 (ft)	CHL 1 (mg/L)	ELEV 2 (ft)	CHL 2 (mg/L)	ELEV 3 (ft)	CHL 3 (mg/L)	MAX CHL. 14-15	13-14	(FY14-15 - FY13-14)
42	34H 25	502AH	20150407	A	-297	73	-312	101	-331	70	101	86	15
43	34HJ	502BX	20150330	A	-310	89	-321	90	-331	90	90	293	-203
44	34JL	503AP	20150331	A	-263	84	-288	84	-308	86	86	64	22
45	34L 10	502AM	20150304	A	-310	75	-330	70	-354	100	100	55	45
46	34LS	503BD	20150331	A	-238	75	-283	71			75	57	18
47	34N 21	512B	20150303	A	-328	60	-354	62			62	70	-8
48	34U 8	513F	20150326	A	-280	74	-310	81			81	98	-17
49	34V 20	513B	20150326	A	-234	81	-265	81	-292	81	81	96	-15
50	34VZ	503BH	20150330	A	-146	88	-156	87			88	69	19
51	34W 5	503AJ	20150310	A	-81	391	-101	357	-119	358	391	75	316
52	34X40	513P	20150406	A	-202	50	-232	235			235	172	63
53	35E0.1	503BK	20150401	A	-74	95					95	156	-61
54	35F 20	513J	20150326	A	-129	95	-158	284			284	104	180
55	35H 11	514G	20150409	A	-123	1,230	-146	3,340			3,340	4,690	-1,350
56	35H 12	514D	20150409	A	-137	173					173	440	-267
57	35J1	514L	20150409	A	-193	83	-208	83	-228	430	430	223	207
58	35K1	523B	20150406	A	-197	14	-212	400	-227	428	428	409	19
59	36F 1	505D	20150310	A	-99	1,130					1,130	736	394
60	OCWD-BS14/3		20150324	A		2,140					2,140	n/a	n/a
61	OCWD-BS21/3		20150203	A		580					580	n/a	n/a
60	33G					DP1					50	50	n/a
61	33J					DP2					50	50	n/a
62	33L					DP3					50	50	n/a
63	33N					DP4					50	50	n/a
64	33Q					DP5					50	50	n/a
65	33S					DP6					50	50	n/a
66	33T					DP7					50	50	n/a
67	33U					DP8					50	50	n/a
68	33V					DP9					50	50	n/a
69	33W					DP10					50	50	n/a
70	33X					DP11					50	50	n/a
71	33Y					DP12					50	50	n/a
72	33Z					DP13					50	50	n/a
73	33Z2					DP14					50	50	n/a
74	34D					DP15					50	50	n/a
75	34F					DP16					50	50	n/a
76	34H					DP17					50	50	n/a
77	34J					DP18					50	50	n/a
78	34L					DP19					50	50	n/a
79	34S					DP20					50	50	n/a
80	34V					DP21					50	50	n/a
81	35G					DP22					50	50	n/a
82	35H1					DP23					50	50	n/a
83	35H2					DP24					50	50	n/a

DP = Dummy Point with an assumed chloride concentration of 50 mg/L. Placed at wells that were injecting into this zone during this reporting period.





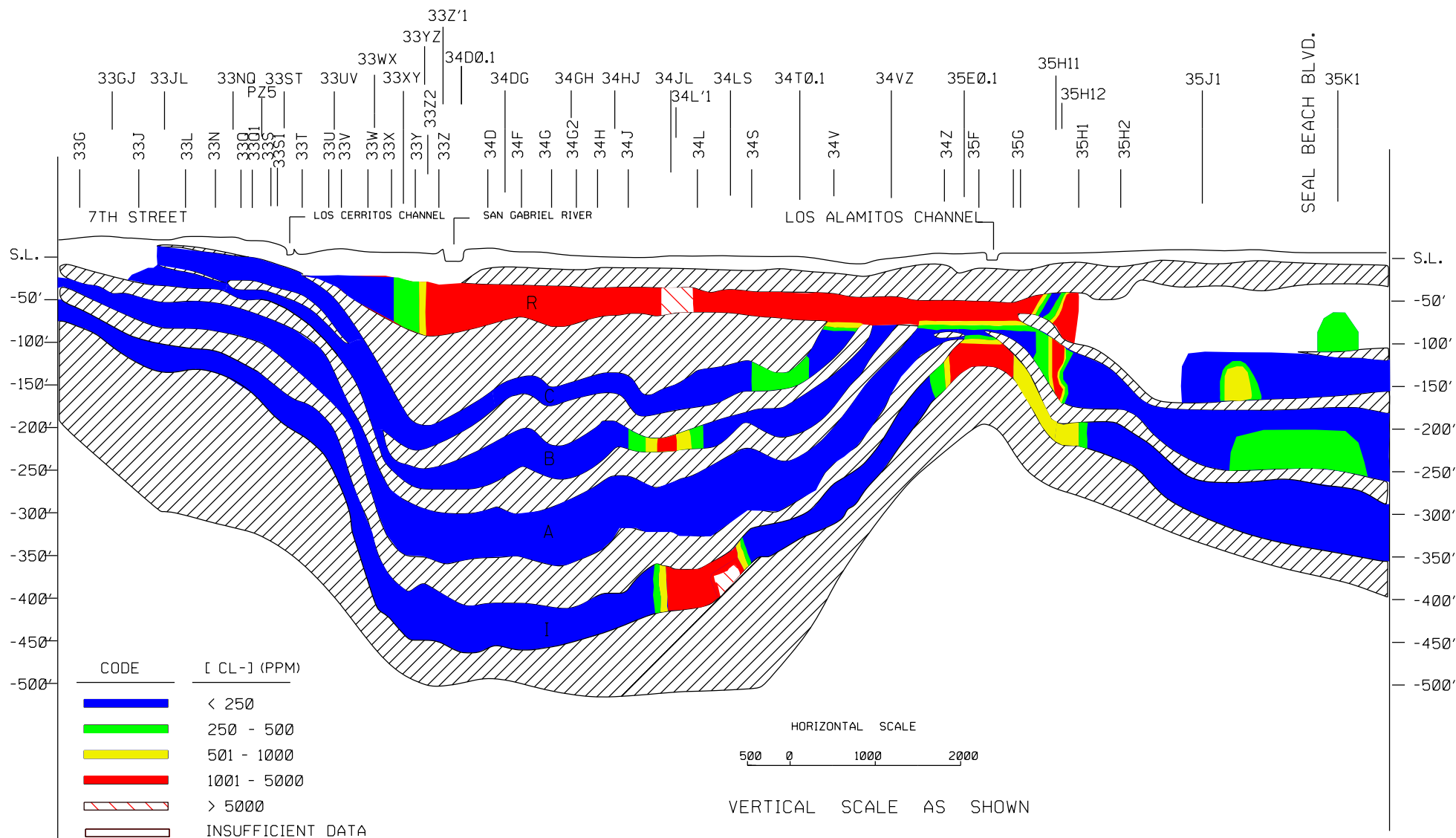
ALAMITOS BARRIER PROJECT
I-ZONE CHLORIDE CONCENTRATIONS
Chloride Data Used for Contours and Cross-Section

No.	PROJ	FCD	DATE	AQUIFER	For Cross-Section (Internodal Wells in Bold)						For Contours	MAX CHLORIDE	Change in Chloride
					ELEV 1 (ft)	CHL 1 (mg/L)	ELEV 2 (ft)	CHL 2 (mg/L)	ELEV 3 (ft)	CHL 3 (mg/L)	MAX CHL. 14-15	13-14	(FY14-15 - FY13-14)
1	32U 15	482L	20150218	I	-74	170					170	134	36
2	32V 22	482N	20150219	I	-51	250					250	111	139
3	32V'10	483E	20150219	I	-140	220	-152	250	-165	270	270	828	-558
4	32X11	482R	20150316	I	-51	369	-61	690			690	725	-35
5	32Z'5	482V	20150223	I	-68	550	-83	640	-98	1,000	1,000	787	213
6	33D0.1	482U	20150316	A,I	-24	91	-49	110	-74	91	110	482	-372
7	33G 9	482G	20150224	I	-34	89	-68	99	-78	92	99	182	-83
8	33GJ	482Y	20150317	I	-75	74	-95	89			89	79	10
9	33H'13	493XX	20150226	I	-89	350					350	280	70
10	33JL	492BW	20150317	(A,I)	-41	71	-79	87	-116	77	87	85	2
11	33N 21	492BV	20150218	I	-457	82	-468				82	67	15
12	33NQ	492BP	20150317	(A,I)	-48	86	-92	94	-136	93	94	72	23
13	33S 40	491F	20150224	I ZONE	-470	370					370	296	74
14	33ST	492BM	20150317	I ZONE	-130	90	-148	87	-163	85	90	88	1
15	33T 4	492CQ	20150318	I ZONE	-277	83	-292	99			99	109	-10
16	33T 9	492XX	20150319	I ZONE	-364	130					130	80	50
17	33T 12.5	492BT	20150226	I ZONE	-423	130	-438	120	-443		130	127	3
18	33U' 3	492QQ	20150225	I ZONE	-147	290					290	192	98
19	33UV	492BJ	20150325	I ZONE	-209	83	-228	83	-246	82	83	83	0
20	33V' 8	492BX	20150225	I ZONE	-109	5,200	-130	5,600			5,600	4,610	990
21	33W 11	502U	20150324	I ZONE	-423	81	-446	80	-468	79	81	75	6
22	33WX	502AG	20150325	I ZONE	-374	69	-391	67	-405	69	69	61	8
23	33X 10	502BE	20150302	I ZONE	-420	790	-440	420	-460	200	790	634	156
24	33X 20	502H	20150324	I ZONE	-442	79					79	76	3
25	33XY	502BP	20150402	I ZONE	-404	83	-417	82	-431	80	83	70	14
26	33Y'35	493ZZ	20150303	I ZONE	-67	24,000					24,000	21,800	2,200
27	33YZ	502AE	20150402	I ZONE	-402	88	-433	89			89	67	23
28	33Z 11	502W	20140917	I ZONE	-417	448	-437	460	-457		460	661	-201
29	34D' 6	502BI	20150304	I ZONE	-400	5,200	-410	5,200	-418		5,200	4,810	390
30	34DG	502AA	20150330	I ZONE	-402	79	-432	79			79	78	2
31	34E'13	503AT	20150303	I ZONE	-289	1,900	-308	15,000			15,000	6,130	8,870
32	34F 5	502BQ	20150401	I ZONE	-411	66	-426	65	-441	66	66	66	0
33	34F 10	502AS	20150323	I ZONE	-416	79	-442	80			80	62	17
34	34GH	502BV	20150401	I ZONE	-412	83	-427	80	-437	86	86	70	16
35	34H5	512D	20150402	I ZONE	-408	280	-423	245	-443	233	280	233	47
36	34H 25	502AJ	20150407	I ZONE	-407	430	-427	554			554	561	-7
37	34HJ	502BW	20150330	I ZONE	-407	85	-417	83	-427	82	85	63	22

ALAMITOS BARRIER PROJECT
I-ZONE CHLORIDE CONCENTRATIONS
Chloride Data Used for Contours and Cross-Section

No.	PROJ	FCD	DATE	AQUIFER	For Cross-Section (Internodal Wells in Bold)						For Contours	MAX CHLORIDE	Change in Chloride
					ELEV 1 (ft)	CHL 1 (mg/L)	ELEV 2 (ft)	CHL 2 (mg/L)	ELEV 3 (ft)	CHL 3 (mg/L)	MAX CHL. 14-15	13-14	(FY14-15 - FY13-14)
38	34JL	503AN	20150331	I ZONE	-383	89	-403	2,390			2,390	284	2,106
39	34L 10	502AN	20150311	I ZONE	-404	90	-426	75			90	36	55
40	34LS	503BC	20150331	I ZONE	-338	106	-368	5,650			5,650	8,650	-3,000
41	34N 21	512C	20150303	I ZONE	-423	73	-448	74			74	76	-2
42	34N' 7	503AG	20150305	I ZONE	-221	64	-254	160	-274	160	160	519	-359
43	34T0.1	503AD	20150331	I ZONE	-289	216	-312	149	-334	138	216	101	115
44	34U 8	513G	20150326	I ZONE	-360	314	-375	311			314	127	187
45	34V 20	513C	20150326	I ZONE	-386	95					95	246	-151
46	34VZ	503BG	20150330	I ZONE	-214	88	-224	87			88	63	25
47	34W' 5	503AK	20150310	I ZONE	-156	5,490					5,490	4,860	630
48	34X40	513N	20150422	I ZONE	-331	1,830	-346	1,680			1,830	2,050	-220
49	35E0.1	503BJ	20150401	I ZONE	-114	2,550					2,550	602	1,948
51	35F 20	513H	20150326	I ZONE	-235	2,610	-245	3,340	-255	3,540	3,540	3,210	330
52	35H 11	514H	20150409	I ZONE	-203	774					774	860	-86
53	35J1	513M	20150409	I ZONE	-261	162	-271	227			227	218	9
54	35K1	523C	20150406	I ZONE	-363	28					28	30	-2
55	35N0.1	504N	20150309	I ZONE	-71	10,000					10,000	11,800	-1,800
56	OCWD-BS14/4			I ZONE		231					231	n/a	n/a
57	OCWD-BS21/4			I ZONE		1,280					1,280	n/a	n/a
58	33G					DP1					50	50	n/a
59	33J					DP2					50	50	n/a
60	33L					DP3					50	50	n/a
61	33N					DP4					50	50	n/a
62	33Q					DP5					50	50	n/a
63	33U					DP6					50	50	n/a
64	33V					DP7					50	50	n/a
65	33W					DP8					50	50	n/a
66	33X					DP9					50	50	n/a
67	33Y					DP10					50	50	n/a
68	33Z					DP11					50	50	n/a
69	33Z2					DP12					50	50	n/a
70	34D					DP13					50	50	n/a
71	34E					DP14					50	50	n/a
72	34F					DP15					50	50	n/a
73	34G2					DP16					50	50	n/a
74	34H					DP17					50	50	n/a
75	34J					DP18					50	50	n/a
76	34L					DP19					50	50	n/a
77	34S					DP20					50	50	n/a
78	34V					DP21					50	50	n/a

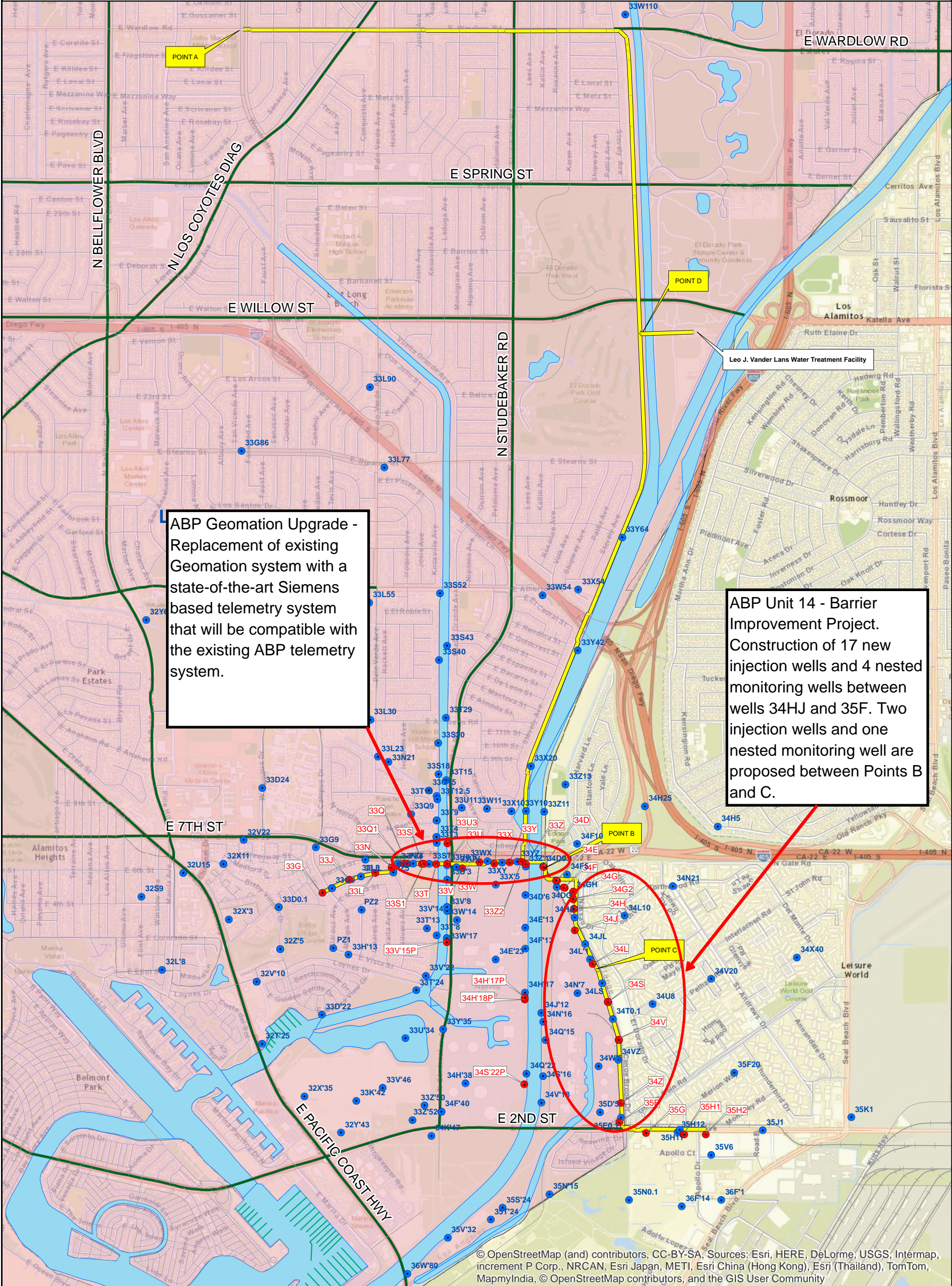
DP = Dummy Point with an assumed chloride concentration of 50 mg/L. Placed at wells that were injecting into this zone during this reporting period.





ALAMITOS BARRIER PROJECT

Overview Map



0 1,200 2,400 4,800
Feet

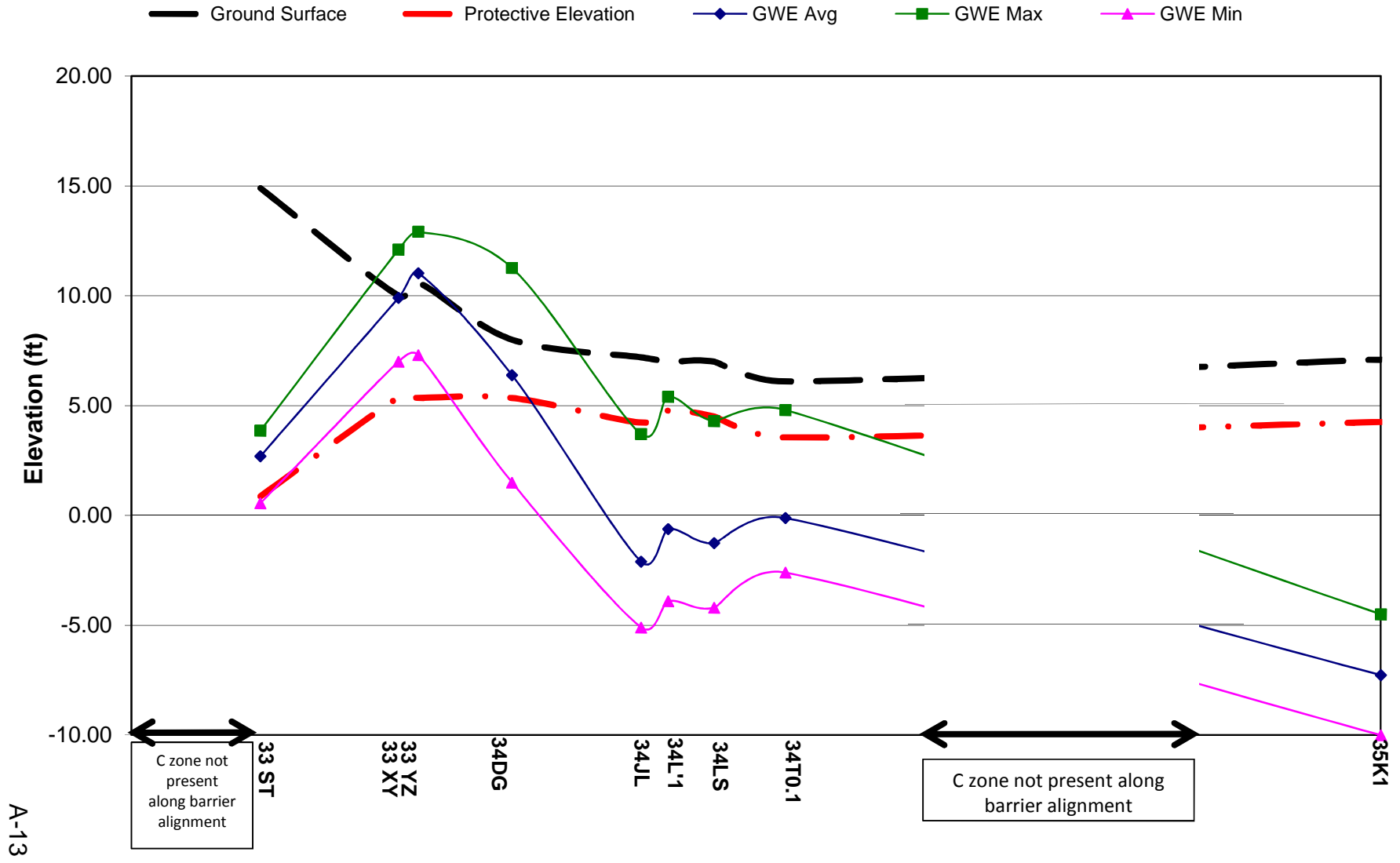
Legend

Alamos Injection Well

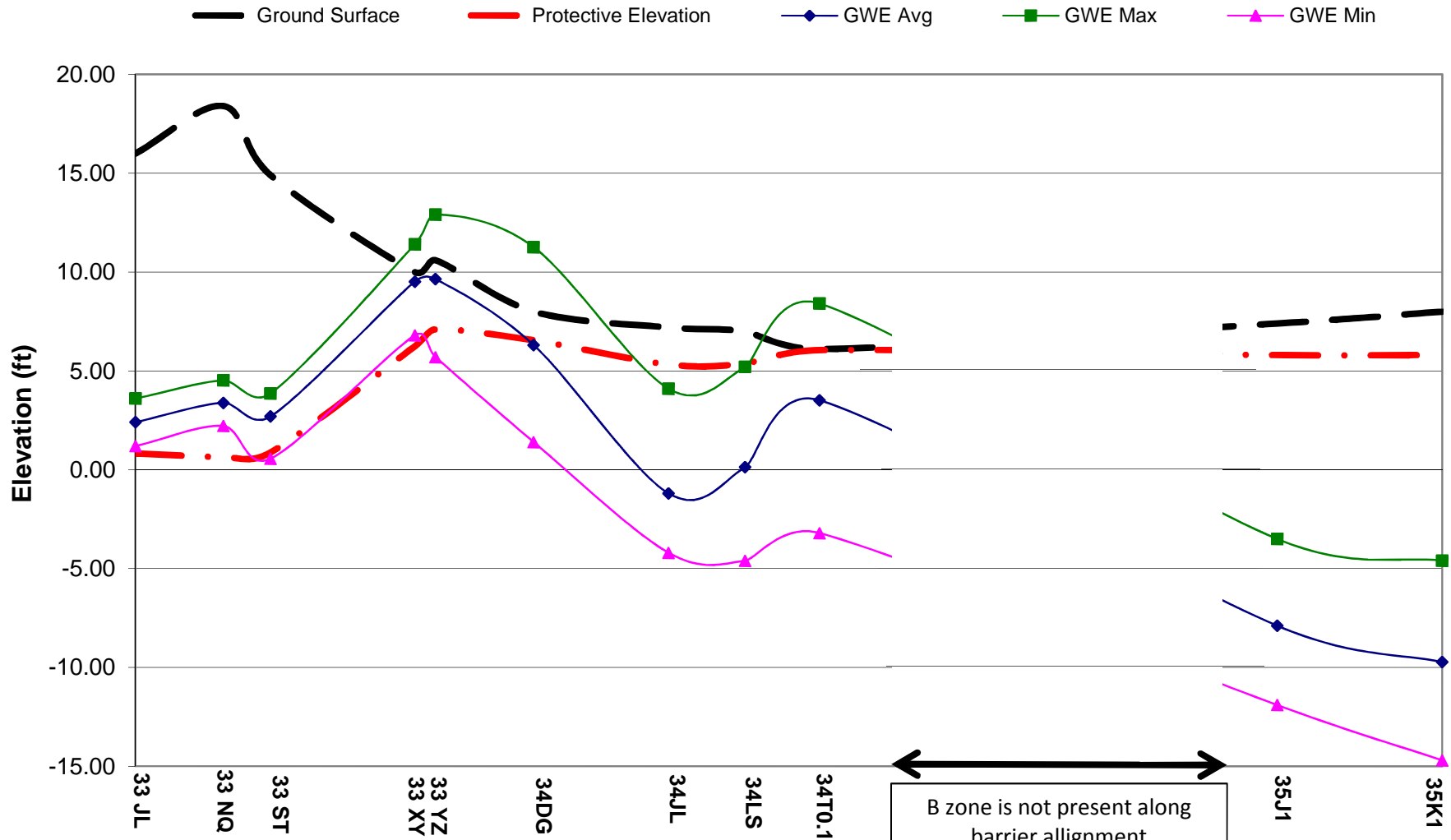
Observation Well

ABP Water Supply Line

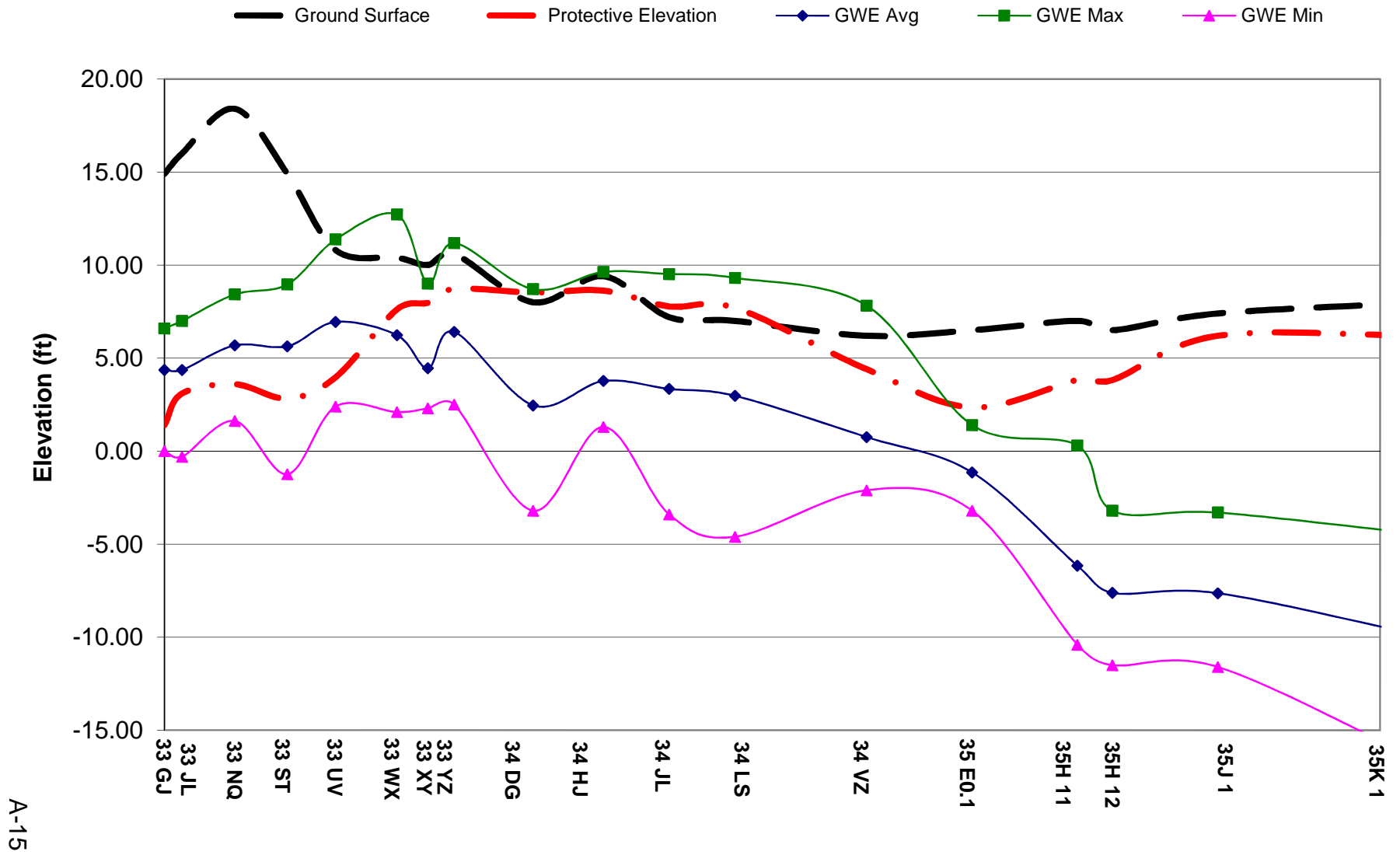
C Zone - Groundwater Elevation (GWE) Along the ABP FY 2014-15



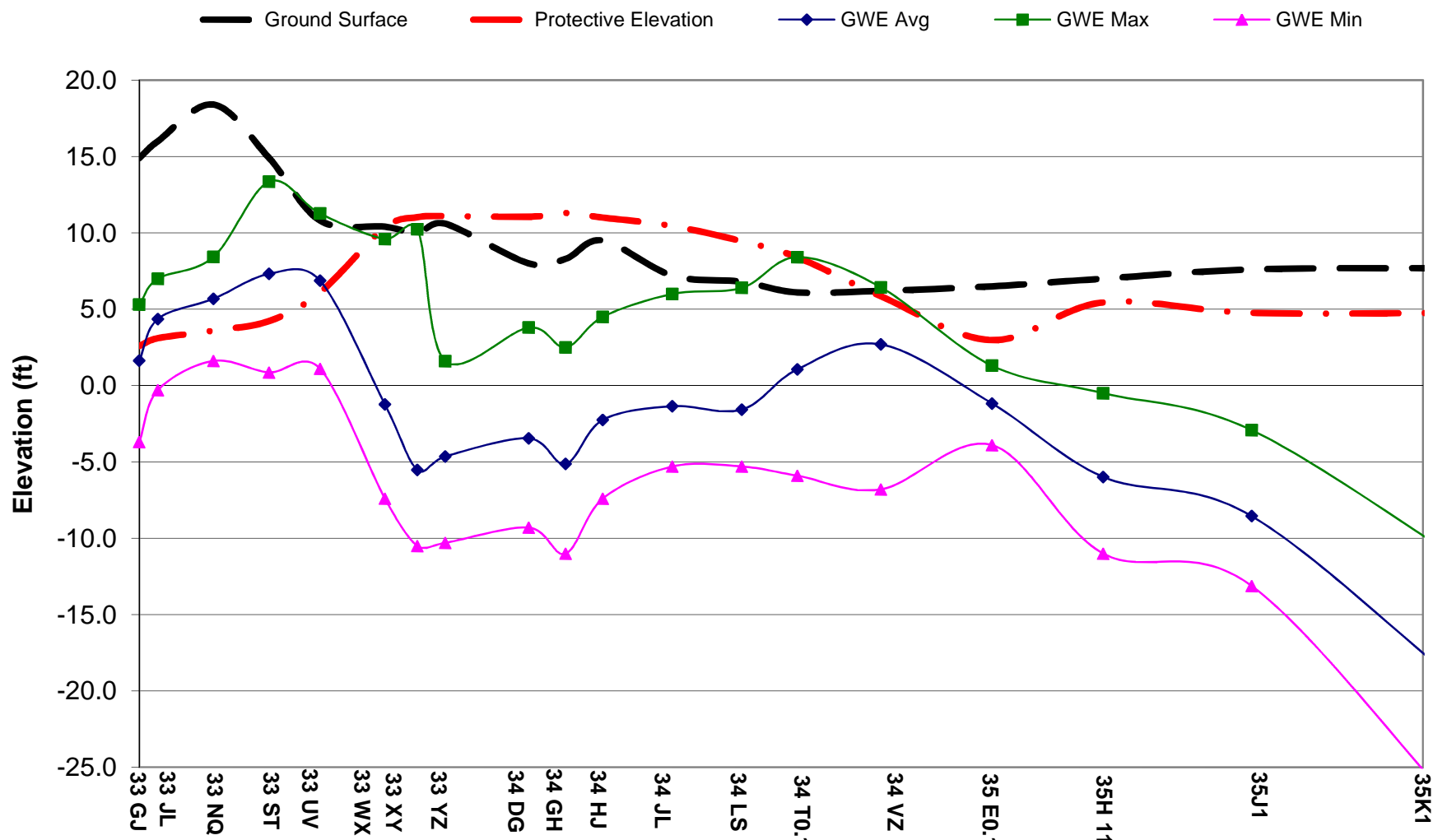
B Zone - Groundwater Elevation (GWE) Along the ABP FY 2014-15



A Zone - Groundwater Elevation (GWE) Along the ABP FY 2014-15



I Zone - Groundwater Elevation (GWE) Along the ABP FY 2014-15



Current Capital Improvement Projects and Contracts (July 2014 through June 2015)

Board Award Date	Project Title	Description	Contractor	Final Contract Amount	Field Acceptance
Anticipated June 2016	ABP Telemetry Upgrade	Replace existing Geomation system with Siemens based system, also incorporate signal from wells 33U3 and 34E	TBD	\$350,000 [Estimated]	Spring 2017 [Estimated]
Anticipated early 2016 by OCWD	ABP Unit 14 - Injection and Observation Wells	Construction of 17 new clustered injection wells (8 locations), 4 nested observation wells, and 2 shallow piezometers	TBD	\$14,752,000 total \$2,506,000 for LACFCD facilities [Estimated]	Fall 2017 [Estimated]

Note: For a full history of improvement projects and contracts on record, please contact LACDPW.

Summary of the Alamitos Barrier Project Shutdowns (July 2014 through June 2015)

Shutdown	Startup	Duration (days)	Impacted Portion of ABP	Reason	Addressed By	Means of Repair/Remediation
02/15/2013	10/14/2015	971	Well 34G	Return of Surface Leakage	LACDPW	Injecting with limited flowrate. Geotechnical investigation revealed consistent clay cap in vicinity of well. Video showed poor welds between casing segments. Packer will be installed just above perforations.
10/13/2013	10/14/2015	731	Well 33W	Surface leakage	LACDPW	Verified the surface leakage and resumed injection with limited flowrate.
05/15/2014	N/A	N/A	Well 34H(A)	Overpressure, will not take water.	LACDPW	Well is filled with sediment due to hole near top of perforations. Well to be abandoned
11/10/2014	03/23/2015	133	Well 34S	Manifold ruptured, damaged Los Alamitos access road	LACDPW	Well was shut off, channel access road repaired, manifold was fabricated and replaced.
11/10/2014	03/23/2015	133	Well 34V	Similar manifold in danger of rupturing, shut off for repair	LACDPW	Well was shut off, channel access road repaired, manifold was fabricated and replaced.

Notes:

* Routine and/or minor shutdowns of individual wells are not listed here but are included in Figure 3 of the Annual JMC Report and Table 2 for the Semi-Annual Meeting.

Alamitos Barrier Project Cost for FY 2014-15

ITEM NO.	DESCRIPTION	JOB NO.	DESCRIPTION	SERVICES AND SUPPLIES	FY 2013-14 BUDGET	% BUDGET FY 14-15	OCWD SHARE 31%	OCWD BUDGET FY 14-15	% OCWD BUDGET FY 14-15	LADWP SHARE	LADWP BUDGET FY 13-14	% LADWP BUDGET FY 14-15
1.	Analysis and direction of injection operations	H0321551 H0321550	ABP ANALY&DIR OF INJECTION O BARRIER PROJECT OPERATION-GEN	41,528.88 48,978.20	75,000	120.7	28,453.41	26,250	108.4	62,053.67	48,750	127.3
			Subtotal #1	90,507.08								
2.	Maintenance and repair of injection wells	F6004011 F5064011 H0321911 F6980080F HF01511000 HF01514000	MAINT INJECTION WELLS - ABP INJECT. WELLS-MAINTAIN(ALAMITO Alamitos Barrier Proj-Telemetry Main MAINT ENGR - BARRIER PROJ DGBP Automated System Alamitos Barrier Project Injection W City of Seal Beach Permit	234,555.79 32,151.96 92,241.26 1,858.66 39,899.17 43,706.31 160.25								
			Subtotal #2	444,573.40	400,000	111.1	139,763.96	140,000	99.8	304,809.44	260,000	117.2
3.	Operation of injection	F6004000 F5098070	RECHARGE OPER U/S - ABP DU-AL-WC BARRIER PROJECTS	35,539.68 247.56	35,000	102.2	11,250.71	12,250	91.8	24,536.53	22,750	107.9
			Subtotal #3	35,787.24								
4.	Analysis and direction of extraction operations (No cost to OCWD)	H0321555	ABP ANALY&DIR OF EXTRACT OPE	693.15	0	N/A	0.00	0	0.0	693.15	-	-
			Subtotal #4	693.15								
5.	Maintenance, and repair of extraction wells (No cost to OCWD)	F55307848 F55307850 F55307852 F55307853 HF01514001	REPAIR WELL 33V'15P - A.B.P. REPAIR WELL 34H'17P - A.B.P. REPAIR WELL 34H'18P - A.B.P. REPAIR WELL 34S'22P - A.B.P. ABP Extraction Well Condition Assess	1,241.82 1,649.28 1,176.78 769.32 3,926.33	200,000	N/A	0.00	0	0.0	8,764	200,000	4.4
			Subtotal #5	8,763.53								
6.	Operation of extraction wells (No cost to OCWD)	F6000090	NON-LABOR EXP BARRIER (ALMT)	4,257.33	5,200	81.9	0.00	0	0.0	4,257.33	5,200	81.9
			Subtotal #6	4,257.33								
7.	Maintenance and repair of distribution system	H0321569 F6004010 F6004012 N2420007 F6004014F F6004022 H0321016 H0321613 F6001907	ALAMITOS BARRIER PROJECT MAINT AIR/VAC-BLOWOFF U/S - ABP MAINT PRS - ABP MISC. SUPPLIES SEAWATER INTRUS ABP Locate & Mark Barrier Proj. U/gr WATER SAMPLING Seawater Barriers Administrative Sup ABP HYDRO ELECT-EMD M&R INSPECT CRANE PRES REDUCE - ABP	195,925.10 1,545.90 46,927.80 392.33 22,371.20 651.28 54,370.77 5,861.90 2,185.88								
			Subtotal #7	330,232.16	300,000	110.1	103,817.63	105,000	98.9	226,414.54	195,000	116.1
8.	Maintenance of observation wells	F5064044 F6005205 F6005258 F6005273	OBSERV. WELLS-CLEANOUT(ALAMITO POST EMERGENT WEED CONTROL POST EMERGENT WEED CONTROL POST EMERGENT WEED CONTROL	72,174.28 146.20 179.26 282.76	50,000	145.6	22,881.20	17,500	130.7	49,901.31	32,500	153.5
			Subtotal #8	72,782.51								
9.	Collection of groundwater data	H0321552	ABP COLL OF GR WTR DATA FOR City of Seal Beach Permit City of Seal Beach Permit	196,044.04 260.50 320.50	150,000	131.1	61,814.51	52,500	117.7	134,810.51	97,500	138.3
			Subtotal #9	196,625.04								
10.	Yard Maintenance	FFM34107 FFM34107OS F6001904 F6001906 F6001920 F6002707 F6003123 F6003124 F6007022	Facility Maintenance Alamitos Yd F10 Planned Maint. Alamitos Yd F107-OSD CONDUCT QUARTERLY INSPECTION CONDUCT QUARTERLY INSPECTION CONDUCT QUARTERLY INSPECTION PAINT EXT OF GARGE OFFICE BUILDING MAINTENANCE NONRESI BUILDING MAINTENANCE-NONRESI LANDSCAPE MAINTENANCE	47,848.62 873.09 301.22 87.37 178.22 266.59 2,018.15 1,829.86 1,170.88	60,000	91.0	375.00	6,500	5.8	54,198.99	53,500	101.3
	(Flat Fee from OCWD)		Subtotal #10	54,573.99								
11.	Well redevelopment	F4046508 F5064022 F55110010 F55256139 F55310584 F55310587 F55310588 F55322916 F55322917 F55322918 F55322919 F55328291 F55342060 F55342061 F55342062 F55351998 F55352824 F6009118 H0321554 H0321565 F5009760F	Safety, fabricate hndrails (redevelop) Redevelop injections wells - ABP REDEVELOP INJ. WELL, 3322 - A.B.P. REPAIR WELL 34H - A.B.P. REDEVELOP INJ. WELL, 35G (A&I) ZONE REDEVELOP INJ. WELL, 34H (I) ZONE - A JET OUT INJECTION WELL FOR VIDEO 34H REDEVELOPMENT WELL 34F (I) ZONE - A. REDEVELOPMENT WELL 34F (A) ZONE - A. REDEVELOPMENT WELL 34E (I) ZONE - A. REDEVELOPMENT WELL 34E (C,B) ZONE - REPAIR WELL 34G - A.B.P. (WATER TEST REDEVELOPMENT WELL 34Z (I) ZONE - AB REDEVELOPMENT WELL 34G2 (I) ZONE - A REDEVELOPMENT WELL 34G2 (C,B) ZONE - REDEVELP INJECTION WELL, 35P - A.B.P REDEVELOP INJECTION WELL 34L - A.B.P Disassemble/Reassemble of Wells ABP ABP WELL REDEVELOPMENT PROGRAM ABP NPDES MONI & REPORT INJ WE DRILL EQPT-MAINT&TEST - Eaton Yard	6,583.53 39,046.78 2,911.97 2,923.28 15,421.29 17,025.61 8,646.69 13,307.48 14,358.79 18,160.63 9,736.97 4,942.00 18,211.72 11,154.03 18,117.71 12,909.13 13,526.29 1,254.16 64,635.49 34,084.09 27,967.04	500,000	71.0	111,580.40	175,000	63.8	243,344.28	325,000	74.9
			Subtotal #11	354,324.68								
12.	Processing of data and preparation of reports	H0321553	ABP DATA PRO & PRE OF REPORT	53,032.70	70,000	75.8	16,672.30	24,500	68.1	36,360.40	45,500	79.9
			Subtotal #12	53,032.70								
13.	Special Programs (No cost to OCWD unless pre-arranged)	HF01515000 H0321591 EF02610112	ALAMITOS BARRIER MONITORING WELL DES ALAMITOS BARRIER PROJ-PLANNING Alamitos Barrier Project Unit 13 Obs	20,166.46 9,852.71 20,003.13	1,000,000	5.0	0.00	0	0.0	50,022.30	1,000,000	5.0
			Subtotal #13	50,022.30								
14.	Reclaim Water Program	H0321556	ABP RECLAIMED WATER SUPPLY	35,088.20	12,000	292.4	11,030.95	4,200	262.6	24,057.25	7,800	308.4
			Subtotal #14	35,088.20								
15.	Projects & Studies (Reimbursable amounts include labor expenses, plus approved contract expenses that are not addressed under a separate agreement).	HF01515001	ALAMITOS BARRIER PROJECT TELEMTRY S	9,996.34	70,000	14.3	3,142.63	24,500	12.8	6,854	45,500	15.1
			Subtotal #15	9,996.34								
16.	ABP Liability Insurance Premiums paid separately by OCWD	N/A	ABP Liability Insurance	71,909.76	75,000	95.9	35,954.88	37,500	95.9	35,955	37,500	95.9
			Subtotal #16	71,909.76								
17. ³	Pipeline R/W (U/S of T) (Costs are reimbursable per 1964 Agreement consistent with pipeline ownership, i.e. 5/23 OCWD, 18/23 LACFCD)			0.00	0	0.0	0.00	0	0.0	0.00		0.0
			Subtotal #16	0.00								
			TOTAL	1,813,769.41	3,002,200	60.4	546,737.59	588,200	93.0	1,267,032	2,376,500	53.3

NOTES:

¹ OCWD share represents 36% of the total costs in all items except for 4, 5, 6, 10, 13, and 16. The percentage is based on amount of overall barrier injection water provided to Orange County portion of the ABP during this fiscal year.

² Per Agreement No. 8458 between the LACFCD and the OCWD, all costs included in Items 4, 5, 6 and 13 are not reimbursable with respect to the OCWD and the OCWD cost for Item 10 is fixed at \$375.00.

³ Per Agreement No. 8458 between the LACFCD and the OCWD, all costs included in Item 16 are reimbursable at the same ratio as ownership of the pipeline upstream of the T-vault (18/23 LACFCD, 5/23 OCWD).

TOTAL OPERATION AND MAINTENANCE COST (not including insurance premium)	\$ 1,741,859.65
ORANGE COUNTY'S SHARE OF THE OPERATION AND MAINTENANCE COST (not including insurance premium)	\$ 510,782.71
Less: Los Angeles County's Share of the FY14-15 Liability Insurance	\$ (35,954.88)
Less: Permit fees paid by OCWD	\$ (741.25)
Less: Advance Deposit Paid by OCWD (50% of the OCWD FY14-15 budget)	\$ (294,100.00)

BALANCE DUE FROM ORANGE COUNTY WATER DISTRICT \$ 179,986.58

* AS OF FY08-10, SHOWING CAPITAL IMPROVEMENT PROJECTS AS THEIR OWN CATEGORY AND ALSO SPLITTING UP LABOR EXPENSES FROM CONTRACT EXPENSES FOR APPLICABLE PROJECTS (WHERE SEPARATE COST-SHARING AGREEMENTS ARE IN PLACE FOR CONTRACT AMOUNTS)

2016-17 OPERATION AND MAINTENANCE BUDGET

JMC No.	Fiscal Year	LACFCD		OCWD		WRD		TOTAL	
		Budget	Actual	Budget	Actual	Budget	Actual	Budget	Actual
1.		Analysis and direction of injection operation (\$)							
	2013-14	52,000	43,588	28,000	24,472			80,000	68,060
	2014-15	48,750	62,054	26,250	28,453			75,000	90,507
	2015-16	48,750		26,250				75,000	
	2016-17	55,250		29,750				85,000	
2.		Maintenance and repair of injection wells (\$)							
	2013-14	195,000	163,057	105,000	91,546			300,000	254,603
	2014-15	260,000	304,809	140,000	139,764			400,000	444,573
	2015-16	260,000		140,000				400,000	
	2016-17	292,500		157,500				450,000	
3.		Operations of Injection Well Facilities (\$)							
	2013-14	26,000	14,919	14,000	8,376			40,000	23,295
	2014-15	22,750	24,537	12,250	11,251			35,000	35,787
	2015-16	19,500		10,500				30,000	
	2016-17	26,000		14,000				40,000	
4.		Analysis and direction of extraction operation (\$)							
	2013-14	0	728					0	728
	2014-15	0	693					0	693
	2015-16	0		0				0	
	2016-17	0		0				0	
5.		Redevelopment, maintenance, and repair of extraction wells (\$)							
	2013-14	5,000	0					5,000	0
	2014-15	200,000	8,764					200,000	8,764
	2015-16	15,000		0				15,000	
	2016-17	10,000		0				10,000	
6.		Operations of Extraction Wells (\$)							
	2013-14	5,200	5,584					5,200	5,584
	2014-15	5,200	4,257					5,200	4,257
	2015-16	6,000		0				6,000	
	2016-17	6,000		0				6,000	
7.		Maintenance and repair of ABP (\$)							
	2013-14	162,500	179,881	87,500	100,991			250,000	280,872
	2014-15	195,000	226,415	105,000	103,818			300,000	330,232
	2015-16	195,000		105,000				300,000	
	2016-17	227,500		122,500				350,000	
8.		Maintenance of Observation Wells (\$)							
	2013-14	97,500	215,433	52,500	120,951			150,000	336,385
	2014-15	32,500	49,901	17,500	22,881			50,000	72,783
	2015-16	195,000		105,000				300,000	
	2016-17	45,500		24,500				70,000	
9.		Collection of groundwater data (\$)							
	2013-14	65,000	94,945	35,000	53,305			100,000	148,250
	2014-15	97,500	134,811	52,500	61,815			150,000	196,625
	2015-16	110,500		59,500				170,000	
	2016-17	130,000		70,000				200,000	
10.		Yard Maintenance (\$)							
	2013-14	44,625	93,239	375	375			45,000	93,614
	2014-15	53,500	54,199	6,500	375			60,000	54,574
	2015-16	75,380		4,620				80,000	
	2016-17	75,380		4,620				80,000	
11.		Injection Well Redevelopment (\$)							
	2013-14	325,000	518,753	175,000	291,245			500,000	809,998
	2014-15	325,000	243,344	175,000	111,580			500,000	354,925
	2015-16	520,000		280,000				800,000	
	2016-17	260,000		140,000				400,000	
12.		Processing of data and preparation of reports (\$)							
	2013-14	45,500	25,200	24,500	14,148			70,000	39,348
	2014-15	45,500	36,360	24,500	16,672			70,000	53,033
	2015-16	45,500		24,500				70,000	
	2016-17	39,000		21,000				60,000	
13.		Special Programs (\$)							
	2013-14	50,000	1,227,246	0	0	300,000	300,000	50,000	1,227,246
	2014-15	1,000,000	50,022	0	0			1,000,000	50,022
	2015-16	350,000		0				350,000	
	2016-17	50,000		0				50,000	
14.		Oversight of Reclaim Water Program (\$)							
	2013-14	7,800	5,744	4,200	3,225			12,000	8,968
	2014-15	7,800	24,057	4,200	11,031			12,000	35,088
	2015-16	9,750		5,250				15,000	
	2016-17	19,500		10,500				30,000	
15.		Projects and Studies (\$)							
	2013-14	46,800	0	25,200	0			72,000	0
	2014-15	45,500	6,854	24,500	3,143			70,000	9,996
	2015-16	45,500		24,500				70,000	
	2016-17	6,500		3,500				10,000	
16.		ABP Liability Insurance (\$)							
	2013-14	0	17,834	0	17,834			0	35,668
	2014-15	37,500	35,955	37,500	35,955			75,000	71,910
	2015-16	37,500		37,500				75,000	
	2016-17	37,500		37,500				75,000	
17.		Joint Pipeline ROW (\$)							
	2013-14	0	266,640	0	74,067			0	340,706
	2014-15	0	0	0	0			0	0
	2015-16	0		0				0	
	2016-17	0		0				0	
18.		Total ABP Expenditure (\$)							
	2013-14	1,127,925	2,872,790	551,275	800,534	300,000		1,679,200	3,673,324
	2014-15	2,376,500	1,267,032	625,700	546,738			3,002,200	1,813,770
	2015-16	1,933,380		822,620				2,756,000	
	2016-17	1,280,630		635,370				1,916,000	
TOTALS		Total ABP Operations and Maintenance (\$ [Item 18-Item 13-Item 16])							
	2013-14	1,077,925	1,645,544	551,275	800,534	0		1,629,200	2,446,078
	2014-15	1,376,500	1,181,055	588,200	510,783			2,002,200	1,691,838
	2015-16	1,545,880		785,120				2,331,000	
	2016-17	1,193,130		597,870				1,791,000	
		Volume of Water (ac-ft)							
	2013-14			2,100	2,406	3,900	4,286	6,000	6,692
	2014-15			2,275	2,236	4,225	4,877	6,500	7,113
	2015-16			2,275		4,225		6,500	
	2016-17			2,450		4,550		7,000	